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INDUSTRIAL SYSTEMS ANALYTICS

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Challenges In The Global Project Management Organization:

Developing Contemporary Solutions

Master`s Thesis
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PREFACE

Doing this thesis has been an interesting journey. When we decided this thesis with my ex supervisor, The World was a different place to live than it is now when thesis is completed and there have been big changes in my life too. I started this thesis in spring 2019 and during the summer I collected most of the theory waiting people back from summer holiday. When autumn started to come, I was able to start collecting my data with interviews. While collecting the data, an opportunity came across and I got a permanent position from the case company.

For obvious reasons thesis was but on smaller gear for a while. Winter came and couple pages I was able to write during each month. At January 2020 I moved to Helsinki and Global Corona virus started to spread in Finland. Travel and movement restrictions were issued. While this thesis was completed, the future seemed a still unclear, hopefully later on when reading this, Corona challenges has been overcome and things are a bit better than now.

First, I want to thank the University of Vaasa for exciting six years. I was able to create personal connections to many employees and learned a lot. Especially the Master's studies was the best time in my University student career where courses were interesting, challenging and student were listen when improving the courses.

Second big thanks go to my current and past team members in work. My whole career in Case company has been interesting journey where is only positive things in my mind. As part of development team where I was hired, I have learned a lot and I feel to be privileged to work with so experienced and professional team, where everyone is taken account.

Lastly, I want to thank my girlfriend and all fellow students, family and closest people to support me and kicking forward with the life.

Helsinki 20th of April 2020

Antti Ylönen

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ABBREVIATIONS

SCI	Supply chain integration
HRM	Human resource management
WoW	Way of Working
PMI	Project Management Institute
PMO	Project Management Office
OE	Operational Excellence
ERP	Enterprise resource planning

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TIIVISTELMÄ

Projektihallinnan tavoite on varmistaa projektien toimitus sovitusti ja sujuvasti, täyttäen aikataululliset, laadulliset, rahalliset ja toiminnalliset vaatimukset. Projektinhallinta katsotaan koostuvan kymmenestä eri osa-alueesta, mitkä muodostavat projektinhallinnan teorian. Projektihallintaa kehittäessä, onkin tärkeää muistaa projektien ainutlaatuisuus, kun teoriaa käytetään pohjana kehityksessä.

Tämä tutkimus tutkii kohdeyrityksen projektinhallinta prosesseja, työkaluja ja raportointimahdollisuuksia asiakkaalle globaalissa ympäristössä. Diplomityön tavoitteena on määritellä globalisaatiosta johtuvat projektihallinnan haasteet. *Työn tutkimuskysymyksenä on määritellä nykyinen projektihallinnan kypsyys ja tunnistaa mahdollisuuksia parantaa kypsyyttä kehittämällä prosesseja ja työkaluja.* Työn Suurimpana haasteena on kohdeyrityksen projektihallinnan globaali ominaisuus, minkä takia projektitiimin jäsenet tulevat ympäri maailmaa. Tämä luonnollisesti luo haasteitta kommunikoinnissa ja yhteisten työskentelytapojen saavuttamisessa.

Tutkimus perustuu vahvasti projektihallinnan teoriaan sekä laadullisiin haastatteluihin. Teoriaa apuna käyttäen, teoreettinen viitekehys saatiin luotua ja haastatteluista saadut tulokset hyödynnettiin ongelmien tunnistamisessa. Haastateltavia oli kuudesta eri valtiosta ympäri maailmaa. Haastatteluiden sekä teorian perusteella, suurimpia tunnistettuja kehityskohteita olivat yhteisien työskentelytapojen puuttuminen tuotelinjojen välillä, useiden rinnakkaisten sekä sisäkkäisten projektihallintaorganisaatioiden eriävät toimintatavat sekä toimintamallit ja itsenäisien organisaatioiden omien työkalujen puutteellinen integroiminen yrityksen ERP systeemiin.

Loppujen lopuksi, keskeiseksi ratkaisuksi tunnistettiin yksi, yhteinen projektihallintatyökalu, kytkettynä yrityksen ERP systeemiin. Tällöin työskentelytapojen olisi pakko muuttua samankaltaisiksi, milloin myös kaikki projektikohtainen tieto olisi yhdessä paikassa, Tällöin kommunikaatioon liittyvät kuormittavat tekijät saataisiin myös osittain eliminoitua. Saatuja hyötyjä voidaan myös hyödyntää sekä sisäisen että ulkoisen raportoinnin yhtenäistyksessä ja automatisoinnissa, kun tieto on ajan tasalla sekä varastoituna paikkaan, mistä sen jakaminen eri alustojen kautta on helppoa ja turvallista. Diplomityö sisältää myös ehdotuksia asiakasraportointiin ja esimerkin mahdollisesta raportointipohjasta hyödyntäen Power bi raportointiohjelmistoa. Tavoitteena on luoda automaattisesti päivittyvä ajan tasalla oleva raportti mihin asiakkaalla olisi aina pääsy. Näin raportoinnista syntyvää kuormitusta voidaan tehokkaasti vähentää, parantaa asiakastyytyväisyyttä ja lähentää yhteistyötä.

AVAINSANAT: Projektihallinta, raportointi, kehitys, nykyaikainen ratkaisu

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ABSTRACT

The main goal of project management is to ensure successful project delivery fulfilling the time, quality, monetary and functionality requirements. The project management methodology is considered to consist of ten knowledge areas that are together forming the theory of project management. When developing the project management, it is important to remember the differences of each project when using theory as a foundation for development.

This research targets company's project management processes, tools and reporting possibilities towards the customer in the global environment. The aims of this thesis is to determine the challenges that globalization generates in project management. *The research question is set to determine the current maturity level of project management and identify possibilities to increase the maturity by developing tools and processes.* The biggest challenge for the study is the global aspect of the target company's project management, where project team members are located all over the World. Naturally, this aspect generates challenges in communication and finding in an aligned way of working.

The research is heavily based on the project management methodology and qualitative interviews. The literature helped build a theoretical framework and data collected from interviews, helped in identifying challenges and problems especially when comparing data against the theory. The interviewees were from six different countries around the world and based on the interviews and theory, biggest challenges were lack of a common way of working principles between product lines, differences between project management departments within the target company, the usage of highly customized, standalone software and lack of integration towards ERP system.

In conclusion, the main solution for these challenges is a common project management tool, connected to the ERP system. Thereby the way of working would automatically align within one tool and all project-related data would be stored in one place. These changes would solve most communicational problems and decrease the time spent on communication. Gained benefits could be taken into use in terms of unifying and automating internal and external reporting. When the information is up to date and stored in a commonplace, sharing the data is easy and safe. This thesis includes also suggestions for customer reporting and an example of a Power Bi report template for a customer. The goal is to create an automated report where a customer would always have access. Consequently, the workload generated by reporting can be decreased and increase customer satisfaction.

KEYWORDS: Project management, Reporting, Development, Contemporary Solution

1 INTRODUCTION

1.1 Background of the study

Everything around us, societies, businesses, technologies are constantly evolving. The phase of how fast progress goes forward is only increasing exponentially. Where the World is evolving, the enterprises must continuously improve to keep up in competition on constantly evolving global markets. Several methods have been introduced to support continuous development, for example, the Deming cycle (PDCA). To efficiently perform a business, project management methodology was created to determine the framework of how bigger cases could be handled with an efficient way to meet expectations, from the start to the end within the agreed time, cost and scope. For example, building a house is a good example of a traditional project, where construction budget and scheduling of different phases have to be made. When the construction work proceeds, the budget and schedule will be followed.

Project management methodology builds upon multiple sub knowledge areas where each is acting an important role in project management. Project management includes planning, monitoring, organization and controlling all different aspects present in the project. The motivation is to complete the goals of the project conducting safe manners, agreed schedule, budget and performance criteria. (IPMA 2006) Every one can imagine, that project management is consisting much more than time, cost and scope, when moving from a car buying project to more complex multi-product project delivery for marine industry where different type of machines has to be integrated with automation to sensors, controls and in the case of emergency do right things to save lives. What then if the interfaces of the two products are not compatible? Integration management is then failed, and corrective actions must be done, the project will be delayed, cruise ship construction will be delayed, thousands of people's holiday cruise will be delayed or if we come back to the buying a car example, what if the price of the car is double or you will get the car later than one year when the car was actually needed?

When enterprises are doing business with project deliveries, the importance of project management has increased significantly. How to properly ensure that interfaces between two products are compatible or how to ensure that there will be a positive margin at the end of the project? These are the questions that are affecting and keeping certain enterprises at the top of the hill leaving other companies struggling, even when the market status is not favorable. Multiple studies are highlighting the benefits gained from the successful usage of knowledge areas within project management, whereas an example of integration management has a strong relation to the performance of the project.

Project management is strongly related to the project manager, but also the organization aspects are affecting project management. Highly mature project management organizations tend to restrict the authority of the project manager. In these cases, the methods, tools and organization should support the project manager. High maturity also requires a high level of integration, which the organization should provide to the project team. Without integration, time will be consumed for an internal task, and easily the main tasks of the project manager are forgotten, which are managing stakeholders and the actual project. The organizations around project management should concentrate to support the project management instead of project management supporting other organizations.

In the era of digitalization, the importance of project management tools is increasing dramatically and the competence to produce these tools has increased drastically. The amount of collected data has grown exponentially since the beginning of the 21st century and big data concept is strongly present (Arruda, Madhavji 2017). While project management is a multi-dimensional concept where areas of managing, scheduling, controlling, communicating and forecasting, the efficient usage of all available data would bring huge benefit especially for project managers.

Right decisions can be made when the amount and quality of the data are enough. But this is not enough yet, especially in enterprises where project management can be count as a competitive advantage. While the size of the project scope increases, the importance of the micromanagement at higher levels should decrease. Projects contain multiple

products, which are manufactured all over the world, which reveals the importance of getting correct and accurate data.

While the Project management unit has grown significantly in the target company, the need for a more efficient and centralized tool is recognized. The project teams are global, where project team members are from different countries and continents. High time differences are generating challenges to efficiently communicate and make quick actions within the project. To make quickly right decisions, people must trust moreover to the data provided by other supportive functions and team members. If project management could utilize efficiently one tool, where globally, all project related information would be stored, the communication flow, decisions and way of working would be harmonized. This tends to lead to decreases possibility of negative risks occurring and ensures success in the project.

There have been several attempts to create a common project management tool for project managers, which would provide a commonplace to have all project related information. The biggest obstacle in the development of the tool is the way to efficiently connect data from various databases. Currently, project managers must use over five different tools to manage and get all the required information. In the past when a need for new tools came, the easiest way was chosen, and always new software was developed to fulfil that certain need. Nowadays the target company has many highly customized software at disposal, which are not integrated.

The subject of the thesis was chosen because of the researcher's interest in project management and how digitalization could support project management in a global environment. The availability of data and how project management can harness the data might be the key aspects in future project management where increased competition, globalization and a high level of digitalization is present and the essential aspect of project management in nowadays business.

1.2 Research question and objectives

Because of the globalization of the target company, where projects are delivered all over the world and manufacturing plants are also located in different countries, project teams tend to be scattered around the world and the effects of globalization are affecting the work of project teams. When globalization might bring benefits it also generates disadvantages and challenges. Therefore, the thesis research question will be as follows: *"What challenges project management organization encounters in the global environment?"*

The objectives of this Master's thesis are, O1: "*What is the level of the project management maturity in target company"* and O2: *"How the maturity can be improved with processes and tools?*". In other words, identify the requirements of the special characteristics of the project management in the target company's global project management unit and suggest solutions to transform challenges into possibilities. When achieving objectives, the target company can more efficiently spend project employee time to generate actual benefits for successful project delivery. Naturally, when efficient working time can be allocated into more productive actions, concrete money savings occur, and customer satisfaction might rise.

1.3 Definitions and Limitations

The thesis will concentrate to study literature around Project management and reporting in global environment subjects, where the focus is more on contemporary solutions and methods for modern project management with digital possibilities. The literature of project management will be gathered according to the PMBOK definition of ten knowledge areas of project management and within reporting, point of interest is around the online reporting where data is automatically fetched from the system.

The scope from the target company side will be limited to an area where project management organization is responsible for, basically the project execution phase, where project management gets an initiated project from the sales department. Literature for a

theoretical framework is collected around ten knowledge areas which are determined by PMBOK. Even though the project management department is not responsible for all aspects within ten knowledge areas, it is vital to understand basics from each area because of the linkage of multiple areas and to understand that project management can be done even without some knowledge areas.

1.4 Structure of the study

The thesis consists of the introduction part where the background of the thesis is presented, the research question and objectives are stated, scope and subject are determined, and the structure of this thesis is described. The second chapter presents the subject, a brief theory of project management from centric literature and academic papers. The methodology chapter will describe the process of how the research for this thesis was made. After the methodology part, the case company is introduced, research findings are opened and analysed. The summary will be at the end of this thesis where everything is summed up for a conclusion.

To recognize the special requirements and characteristics, data will be gathered from interviews and literature. The thesis will include a literature review from Project management were most commonly known literature in the area of project management is referenced and especially what are the most common aspects within project management. Findings from the literature review will be compared against the findings from interviews. Based on the results, suggestions for future development within project management are suggested.

Based on results from literature and interviews, the thesis highlights areas, where future development must be done to support and bring more value, not only for project managers but for the whole project management unit. The results of this thesis are intended to use in the future to identify and more concentratedly recognize the actual need in tool and software development.

2 LITERATURE REVIEW

2.1 Project management

This is the theoretical main chapter of the thesis where the intention is to demonstrate the theory of project management. Project management theory is built on different knowledge areas. Where each area has its methods and tools to efficiently ensure the success of the project. Of course, the nature of the project is determining are all knowledge areas needed in individual projects but for the target company business and projects which are delivered, all knowledge areas were considered to be important in terms of the complexity, scope and the size, where actual projects tend to contain multiple sub-projects.

The chapter will include the literature review about the project management knowledge areas. Topics that are considered in as part of project management are according to the PMI are integration, scope, time, cost, quality, procurement, humans resources, communications, risk and stakeholder management. (PMI 2019) These topics were chosen because the project managers' area of responsibility is not limited only to time, cost and quality management, but instead they are also responsible for integration, human resources, scope, communication, procurement and risk management. (PMBOK 2013: 16-18)

2.1.1 Integration management

Integration management refers to coordination among processes and it is considered as one of the most important elements of project management (Demirkesen & Ozorhon 2017). Integration management strives to manage and coordinate project activities to have a successfully harmonized project environment. It is reflected as a “deliberated process of developing a governance structure, which makes the management of key stakeholder requirements more systematic” (Asif et al. 2010).

Good integration management is considered a key element to have a successful project. The degree of integration in a project affects straight to project performance (Mitropoulos & Tatum 2000) and according to (Berteaux & Javernick-Will 2015) study, the level of internal integration in the organizational level, reflects strongly to the project performance, when considering the integration level of knowledge, process and strategy. The study also indicates that the effects of integration management affect also on an organizational level, improving its performance. The article of (Brannan 2006) states also, that integration management plays a key role when constructing an accurate and successful project budget.

Demirkesen et all. (2017) the study identifies a total of 11 integration management components. After further study, some of these components were merged into a total of six main integration components, which are: knowledge integration, process integration, development of project chart, staff integration, supply chain integration and integration of changes.

Knowledge integration is defined as the sharing of knowledge internally between organizations and departments and externally knowledge is shared with project stakeholders, suppliers and project parties. Knowledge integration is described by (Enberg 2017) as a goal-orientated process to achieve the advantage of the provided differentiated knowledge by individuals. To achieving an effective knowledge process, supportive systems and processes are usually needed to store the knowledge for sharing it efficiently. Unfortunately, it is common that project organizations form “islands of knowledge about project management” states, where each department is developing its own project management methodologies and frameworks. (Bodych 2012)

When complex projects include many attributes, the required level of integration increases. This results in the need for an exchange of knowledge and information within different departments and project partners Mitropoulos et al. (2000). It is commonly acknowledged by many researches, that knowledge integration is a critical part of integration and project management (Demirkesen et al 2017).

Process integration is a definition for activities which are systematically sequenced, and the order of the activities is rational. This means that processes are integrated commonly between project parties and functions. When the process is commonly aligned and integrated, the overall project process might create value in terms of human and task integration (Birkinshaw et al. 2000). Mitropoulos et al (2000) study indicates of increased cost, quality and time efficiency when a design or process is integrated. According to Bodych (2012) when the maturity level of a company is high, it affects the usability of standard processes that can be used by project managers within different phases of the project. It also means that the maturity level will decrease the power of the project manager to choose processes and methods to be used within a project. Engberg (2012) states that good process integration will support the project members by dealing with interdependencies between subsystems, components and activities.

A project charter is a document which "officially" describes the initiation of the project. It is created by the project sponsor or the actual owner of the project and the project manager receives the authority to gather and request organizational resources that are required in project activities. (Brown 2005; Demirkesen et al 2017; PMBOK 2017) When considering bigger enterprises where are different organizations for project management, sales, marketing and etc, the responsibility of project charter might be divided between organizations.

In the case of the thesis target company, the sales department is initiating the project cooperating with project management and manufacturing. Because the scope of this thesis is limited to observe only project management department processes, developing a project charter is left out of the scope in this thesis. The development of project charter would be a jointly developed project between sales and project management because of the roles of departments, where sales act as initiator and project management as a receiver.

Staff integration compresences the integration process of project personnel, integrating the available resources to required positions, where skills & competence, knowledge and experience are taken account when placing resources to correct positions. Integrating correct, supportive tools and processes that are supporting the execution of a successful

project with the support of project staff can be acknowledged as part of staff integration (Demirkesen et al. 2017). According to (Egan 2002), the benefit of successful staff integration can be seen as increased effectiveness in teamwork.

Three major aspects are considered as important when developing effective teams. The first aspect is the ineffective exploitation of the competence and knowledge of experts and specialists within an organization. The second aspect concerns organization members want to be more involved in their total working environment. The third aspect is about the importance of people working together and its possible benefits. (Wilemon & Thamhain 1983) The study of Mitropoulos et al. (2000) states, about the components of the integration mechanism where cross-functional teams, partnering and training in-group skills are highlighted.

Supply chain integration (SCI) is a concept, which describes the level of how the company collaborates its supplying vendors and how processes are managed in internal and external organizational levels. SCI tries to apply an efficient and effective integration of informational, physical and financial flows. (Novais, Maqueira & Ortiz-Bas 2019) According to (Chen, Daugherty & Roath 2009) study, SCI aligns organization and supply chain members functions strategically.

To gain a competitive advantage from SCI, there must be a cross-functional integration of processes and activities, where suppliers and customers and involved in supply chains. (Littler, Leverick & Bruce 1995) Another study of (Troyer & Cooper 1995) states that to achieve the have the full potential of SCI, processes, activities, partners, flows and technology must be integrated.

The integration of changes means the evaluation and review process of changes occurring within project execution. The subject covers modifications, project plan updates, documents and the integration of these into deliverables. Demirkesen et al. (2017) During project execution, there might be a need to modify the schedule or budget of the project. When the Project plan is not properly integrated, there is a possibility for increased

uncertainty in unclear priorities, scope, sudden needs and constraints. This might lead to the changes, delays and rework in a project. Mitropoulos et al. (2000)

These main integration components can be connected to the performance of project management as displayed in figure 1 below. Identified components of integration management affect directly to time, cost, quality, safety and client satisfaction project performance components.

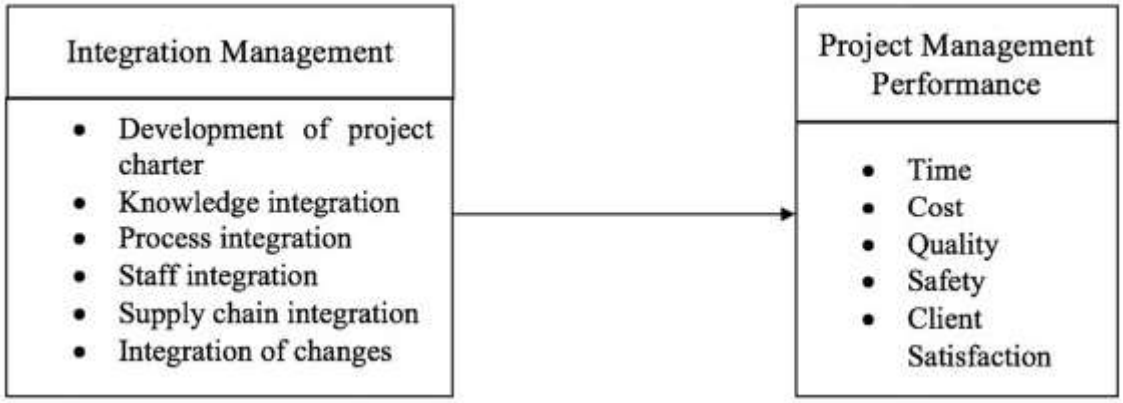

Figure 1. Integration management relation to project management performance. (Demirkesen et al. 2017)

The size and maturity of the enterprises' project management will steer the required integrational management. When larger companies can have a matrix organization where are multiple dimensions, the importance of integration will be significant. According to studies mentioned earlier chapters, the freedom and authority of the project manager will decrease when the integration level within an organization is high. Therefore, integration must support and provide value for the project managers.

2.1.2 Scope, time and cost management

"Scope is the summation of all deliverables required as part of the project. This includes all products, services and results" (Kerzner 2009: 426). The purpose of the project scope is to define what project must create or produce to fulfill the requirements and expectations of project stakeholders (Fageha & Aibinu 2013). According to the study of

(Kähkönen 1999), the scope includes the information which is needed to decide whether or not to proceed to the execution phase with the project. Poor scope management can eventually lead to cost overruns, delays and in worst cases to project failure (Fageha & Aibinu 2013). Scope management intends to clearly define what must be delivered to reach customer satisfaction and therefore the common agreement contracts about the scope are highly recommended. When the scope is accurately determined, uncertainty in the project will decrease and project performance tends to increase when the delivered project meets the expectations.

When considering the projects where the deliverable is a customized product for a customer, it is crucial to have complete understanding about the sold scope, for example, if projects are including products which have been determined by the providing company, the understanding of what materials and components the single product is including and what to be connected modules or parts are left out and included into another product. Therefore, it is crucial to have an internally strong understanding and strict scope definition for each product that is sold to the customer. (Mäkiranta 2020)

The stakeholders should be included in the definition process of the project scope. The scope is usually not completed when one or many stakeholders' concerns, and expectations are not noticed (Atkinson, Crawford, & Ward 2006). Fagehan et al. (2013) state that in private sectors, the scope is reflecting customer needs and the overall goal of projects is customer satisfaction. Therefore, based on the definition of scope, a contract is usually created to reflect the agreed scope definition between project provided and customer.

Time management refers to processes that are required to manage the schedule of the project and complete the project in a given timeframe (PMBOK 2017). Time management is one of the key areas within project management, because of the turbulent nature of project management. People within a project and especially project managers must involve numerous meetings, report, resolve conflicts etc. Kerzner (2009: 285) The methodology for time management has stated as impossible, where attempts to identifying the time management functions with the help of processes and methodologies are tending to end up a failure.

When determining time management, the correct way to do it depends on the actual project, what is the size of the project and how many people is involved. What is the timeframe, scope and complexity? For these reasons is it hard to determine and build on a common approach for time management in the field of project management. The generic target of time management is to understand the current position of project progress versus planned in time aspect.

According to (MacDonald 1983) and (Claessens 2007), the reason for this is that there are too many different processes and methodologies used by professionals and experts within project management and it is impossible to have a common understanding about the time management function. Macdonald (1983) states that time management includes four sub-functions, which are *planning, scheduling, monitoring* and *control.* The time management is based on these four functions, while leaving one function out, the probability of project failure will be high.

Planning includes an initial description of the path that project execution will follow. The planning phase goal is to describe the intention of the project team how the project is going to be executed. The scheduling phase will clarify the relationship between different activities determined in the planning phase. The goal of scheduling is to have a realistic time-based schedule tied to the outcome of the planning phase. Monitoring will exist when a project is proceeding, in other words, there must be moved within a project. The main activity in monitoring is comparing the actual outcome to the planned and act based on whether the results were positive or negative. Monitoring also includes analyzing already past events and trends. To have all these three aspects include, control is needed to ensure that each activity is done. Without control, none of the previous functions could not be existing. Generally, control includes the recognition, what has happened and what will be the outcome and reacting to it. (MacDonald 1983)

Cost management is one of the main areas of project management. The main objective of cost management is to control the costs of the project with planning, estimating, financing, budgeting, managing and funding. (PMBOK 2013: 193) Cost management strives to complete the project within the approved budget. The way, how cost management is

conducted in different companies, depends heavily on the company's and project management's level of maturity. Companies with a higher level of maturity, tend to have cost reporting processes, cost change control systems and performance measurement analysis (Grant & Pennypacker 2006).

As can be seen from figure 2, cost management can be divided into four processes, which are: *planning cost management, estimate costs, determine a budget* and *controlling costs.* Nevertheless, depending on project size, scope and type, some processes can be combined because of the tight linking between processes. (PMBOK 2013: 193)

The cost management planning phase concentrates to determine "the policies, procedures and documentation for planning, managing, expending and controlling project costs" (PMBOK 2013: 195). When considering larger enterprises, where the authority of project managers is already limited, usually cost management planning is done at the corporate level, where the framework for cost management is already determined for project managers. The overall benefit from cost management planning is the higher level of guidance, how costs are overall managed within projects. (PMBOK 2013: 195)

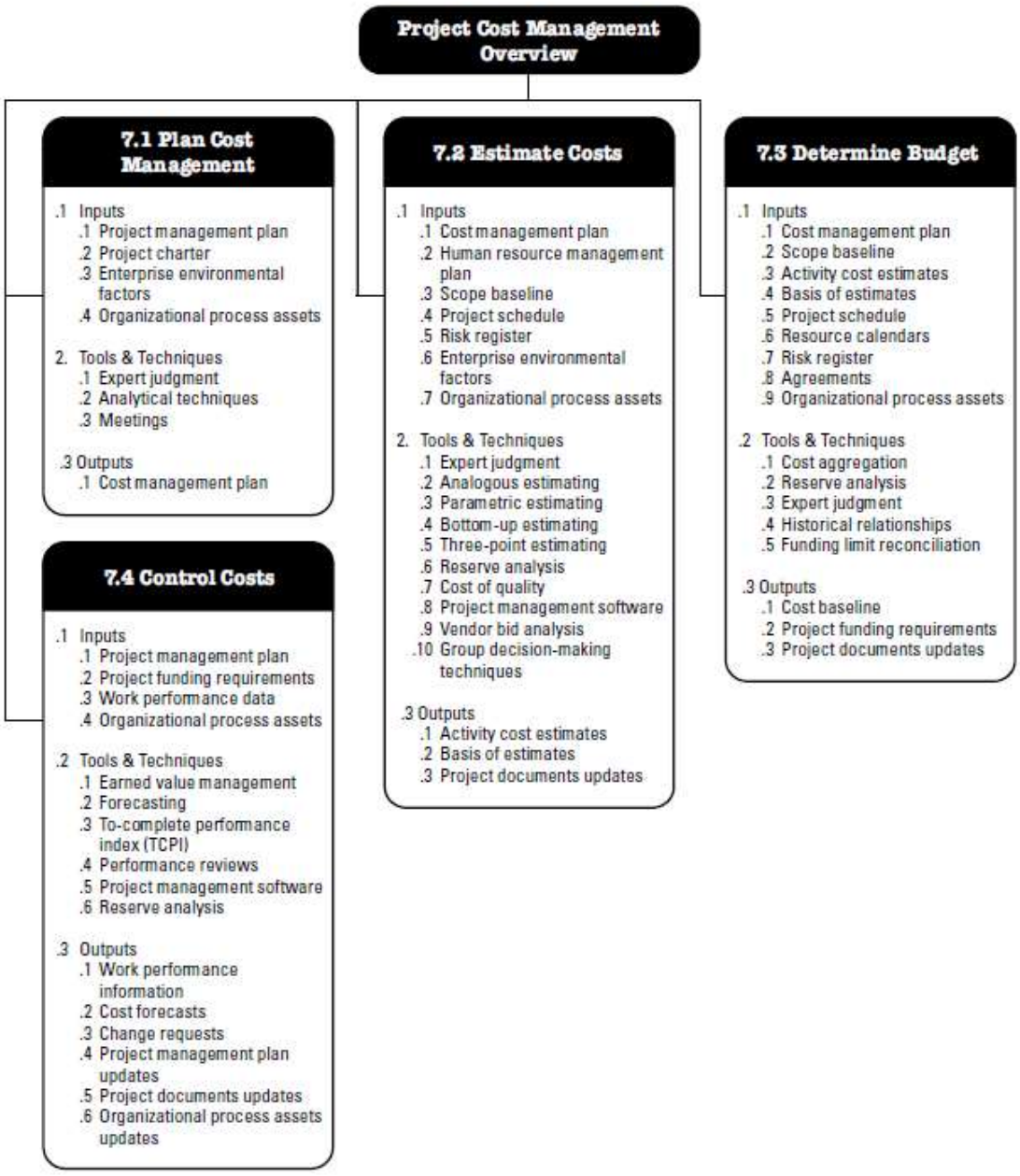

Figure 2. Processes of Project cost management overview. (PMBOK 2013: 194)

PMBOK (2013: 200) defines cost estimating as "prediction that is based on the information known at a given point in time". (Brannan 2006) describes cost estimating as a process where the approximation of the costs of needed resources that are required to complete the project activities are planned. Project cost planning and determining a budget is based on best guesses, because of the competitive bidding between rival

companies. This might end up in the situation, where having reasonable profit form projects might be hard or impossible. (Kerzner 2009: 668)

The estimating process does not belong to the project managers but instead, project managers' responsibility is to manage the estimating process (Syme, Scollo & Tauhert 2003). According to (Burke 1993) project costs can be sub-divided into different costs, which can be seen in figure 3.

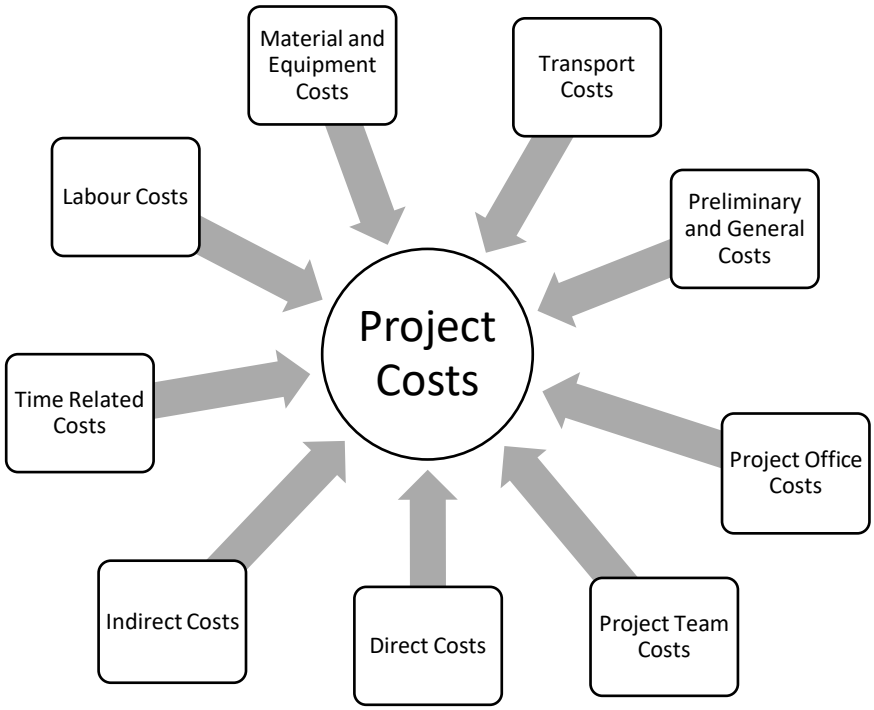

Figure 3. Costs which are considered as Projects costs. Burke (1993)

At the project imitation phase, the baseline for costs is formed. This is also known as the Project budget. The present financial status is compared to the baseline. (Brannan 2006; PMBOK 2013: 208) This enables monitoring and reporting processes to provide actual data about the status and the progress of the project. Kerzner (2009: 644) reminds that budget must be "reasonable, attainable and based on contractually negotiated costs and the statement of work".

Budgets should also include reserves, for risk management and sudden costs, which may occur during project execution. It should be reminded that the budget determines the future baseline, performance and profitability of project. A complete project budget should present project components, and the allocation of funds to each component. (PMBOK 2013: 200 – 213)

” Cost control is equally important to all companies, regardless of size” (Kerzner 2009: 629) Commonly cost controlling is not understood completely, Cost control include much more than only monitoring function. The key element of cost controlling is analyzing the data, to do a right decision. The analyzing data must be done, to succeed in cost management and everyone related to costs, should conduct data analysis. (Kerzner 2009: 630)

Cost control is also considered as a process to identify possible variance and take the right actions in early phases to minimize risks. PMBOK (2013: 216) emphasizes the importance of understanding the present financial status of the project. If there is no knowledge about expenditures versus gained value from expenditures, the value of cost control is low. There should be a common understanding of what are the benefits of consumed money and relationship to benefit what the project receives.

2.1.3 Quality management

“Every project should have a quality management plan” (PMBOK 2013:228). Quality management ensures and enables projects to achieve the required goals. Quality policies, responsibilities and objectives are determined by quality management. Usually, projects in different business areas will have different deliverables, where different approaches and methods are used. Still, when a project fails to achieve quality expectations, consequences can be serious. Nevertheless, a quality level that does not achieve the requirements is always a problem, but a low-quality project which still achieves requirements may not always be a problem. (PMBOK 2013:228-229.)

When considering the definition of quality, organizations of higher maturity level struggles to define the quality because the quality is determined by customers (Kerzner 2009:

875). Project managers should know, what data is available and how this data should be utilized to have efficient communication between stakeholders. (Rever 2007). Customer satisfaction, prevention over inspection, continuous improvement, management responsibility and cost of quality are considered the central approaches within quality management and project quality management can be divided into three sub-processes, which are; *Quality planning, perform quality assurance* and *perform quality control.* (PMBOK 2013: 227-229)

According to (Patterson 1983), one of the most important aspects from the quality management perspective is the information from the meetings with the customer, where a contract is designed because, in contract, customers quality requirements and expectations are defined. Rever (2007), determines the establishment of quality metrics as the most important aspect of quality planning. PMBOK (2013: 231) describes quality management as "the process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with relevant quality requirements."

Quality assurance is defined as a collection of official activities and processes, to that appropriate quality standards and definitions are used accordingly (PMBOK 2013: 242, Kerzner 2009: 888). Rever (2007), defines quality assurance processes as closely linked with continuous improvement and process analysis, where possessing accurate data is the foundation for verifying the quality levels. Kerzner (2009: 888) also mentions that quality assurance is the functions which strives to achieve integration of scope, costs and time functions. The main benefits of quality assurance are listed as follows by (Bobera & Trninić 2006; PMBOK 2013: 242-248).

- Realization of planned project quality
- The products quality is good
- Regulations are met
- Collecting and distribution of data is efficient
- Proper activities are used when needed
- Opportunities are identified much easily

Commonly quality assurance phase is emphasized as the area where the project manager can have the greatest impact to project quality. The project manager must present and convince the project team, how the customer requirements are met, and which tools and methods are used. Good quality assurance system identifies objectives and standards, includes quality audits, is multifunctional, oriented to prevent, supports continuous improvement from the data collection aspect and plans the establishment and maintenance od performance measures. (Kerzner 2009: 888)

Quality control is the last process of quality management, where monitoring project metrics and ensuring that performance is at the desired level. Quality control includes also the aspect of identifying problems and finding a suitable solution. Quality control concentrates to monitor, record and analyze activities within the project. In the quality control phase, the project team is completely involved where each will control and monitor the overall quality of specific aspects. With quality control, projects are achieving the desired requirement and project management performance can be tracked efficiently. The quality control phase will support decision making and drives project managers into correct actions. (PMBOK 2013: 248 – 254; Kerzner 2009: 888 – 889; Rever 2007)

2.1.4 Procurement & Human resource management

“Procurement can be defined as the acquisition of goods or services” (Kerzner 2009: 840). In project management, procurement management includes the contract management and development processes, where contracts and issued purchase orders are developed and administered (PMBOK 2013: 355). In procurement management, the trend of outsourcing has evolved to be a popular business strategy due to intense competitiveness (De Almeida 2007). Therefore, the influence of different suppliers to project success is also increased, where the overall performance of suppliers will affect positively or negatively to project outcomes (Liu, B., Huo, T., Liao, P., Gong, J. & Xue, B. 2014). Naturally, the importance of selectin appropriates qualified suppliers in high, while increasing the confidence of project stakeholders about the project success (Turskis 2008).

The most important thing in procurement management is the selection and evaluation of suppliers. Because Project success is depending much on the suppliers, to find a suitable supplier is crucial. Suppliers' performance must be monitored, evaluated and tracked so that corrective actions can be determined enough early phase when further losses and delays can be evaded or minimized. (de Araújo, Alencar & de Mota 2017)

PMBOK (2013:255) defines the project human resource management as a function, which organizes, leads and manages the project team. Human resource management in projects aims to assign enough employees to the project team, recognize and utilize the special skills of each team members and allocate the workload. There are plenty of studies which are emphasizing the importance of human resource management (HRM) in project success or also studies that indicate that HRM impact to project success is limited (Zwikael & Unger-Aviram 2010)

The main reason for this is the nature of the definition of the project. Kerzner (2009: 2) defined the project as a series of tasks and activities that are multifunctional, receives funding, consumes resources, has defined start and end date and has a specific objective. Therefore, projects nature is often unique, and project teams must perform defined, time-limited specialized projects (Chen, Donahue & Klimoski 2004). These attributes create a

challenging constantly changing working environment, where additional pressure, uncertain requirements and compromising multiple working roles are constantly present. (Turner, Huemann & Keegan 2008)

When considering HRM in companies, the organizational structure must be noted, that members of the project team might come from different departments, therefore, the project teams can be operating in various contexts, environments and organizations (Richards & Moger 2000; Kerzner 2009: 119-131). Because project duration can be determined, the project manager is not able to establish a good mental connection with the project team. This will add one challenge more to the HRM in project management. Where in normal organizations, managers tend to have the same employees over years, in project management, the team can change after each project. (Homayounfard & Safakish 2015)

2.1.5 Communication and risk management

Communication management is defined as managing the right information, to correct place as effective in the manners of cost and time (Kerzner 2009: 233). PMBOK (2013: 287), describes communication as a collection of processes which are needed to "Ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and the ultimate disposition of project information." The article from (Oliver 1983), defines communication management as "the media component of the project". Another research from (Zulch 2014) reveals the link between project manager communication skills and the "cornerstones areas of project management". Also, the study of Zulch (2014), reveals that the three most important communication methods were considered as written, electronic and oral communication, where written communication method was the most important way of communicating.

Another study from Zulch (2014), emphasizes the importance of communication describing it as a vital aspect in "any organized human activity". There are two groups of people within the project which are required to be informed and effectively communicated, stakeholders and project team (Rajkumar 2010). Because of the global environment within larger companies, stakeholders and project team members can have various cultural

backgrounds. Therefore, cultural differences must be taken into account within communication (Abudi 2013). The three identified obstacles in communication are: political, cultural and linguistic. The communication should be always planned according to the overall, current situation of project and communication requirements should be identified. The communicator should also consider that half of communication is listening. (Rajkumar 2010)

Communication within a project should be efficient and stable. Information should be shared between project members, stakeholders and sponsors. Stakeholders are the most important aspect, who should be kept informed and communicated as a top priority. To achieve the actual, up to date awareness about the project, a three-mode communication strategy is used. Three mode communication includes push, pull and interactive communication methods. Push methods aim to deliver and share specific information among a designated group of people around the project, for example, project performance reporting. With the pull method, stakeholders will extract the required information. The interactive communication method includes these two previous methods, which practically means extensive multidirectional communication between stakeholders. The most efficient way to communicate is to combine these three methods. (Aurangzeab, Naaranoja & Savolainen 2016)

Project risk is defined by PMBOK (2013: 310), as an event or condition, which has uncertain nature to occur. Risk can be positive or negative, depending on the consequences. Kerzner (2009: 743) defines risk as a "measure of probability and consequence of not achieving a defined project goal." Kerzner (2009: 743) also defines risk as to the function of probability and consequence, where risk is straight dependable of both attributes. This dependency can be seen in formula 1. Risk management can be determined as the "systematic process of identifying, analyzing and responding to project risks" (PMBOK 2013: 309 – 311). PMBOK (2013) defines the risk management process where is both, qualitative and quantitative risk analysis steps, but (Becker 2004) presents an alternative risk management process where feedback loop is added, and the quantitative analysis phase is left out. The comparison between the two models can be seen in figure 4.

$$Risk = f(Probability, consequence) \quad (1)$$

The most important thing in planning risk management is to identify risks (Rolik 2016). According to (Hillson 2014), risks can be divided into two levels, *risks in the project* and *risk of the project*, where risks in the project describe individual risk or uncertainty, which can affect positively or negatively. The risk of the project is defined as the sum of individual risks on the project. At the project level, the risk of the project should be the key focus area (Hillson 2014). Within the project level, the project team members are identifying risks in various levels and environments, the lack of structured risk management will lead to communication gaps, lack of transparency, and incomplete impact evaluation (Lavanya & Malarvizhi 2008). The main benefits of risk management are improved overall visibility, structured founding for collecting lessons learned and better communication (Becker 2004).

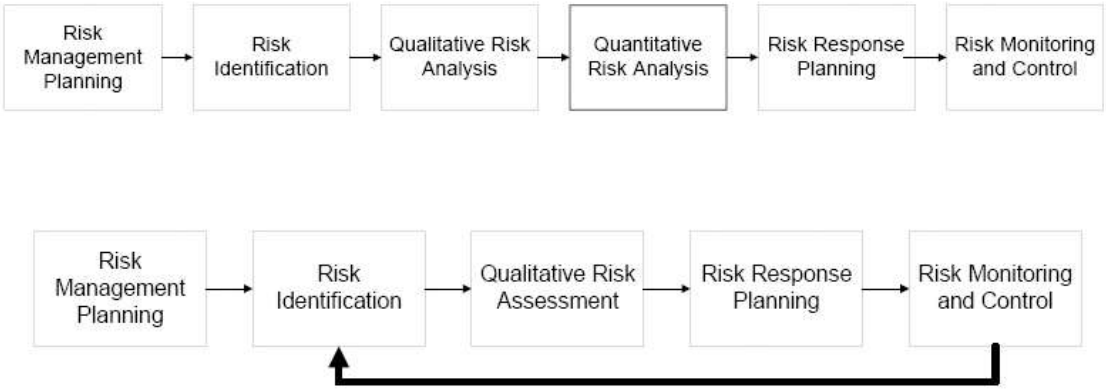

Figure 4. Suggested risk management processes. (Becker 2004)

2.1.6 Stakeholder management

PMBOK (2013), defines stakeholder management as a process to recognize the individual or groups of persons and organizations that might impact or might be impacted by the project. The project office or project team identifies and manages the requirements of stakeholders, collecting expectations, negotiate agreements, and ensuring that stakeholders' objectives are met (Kerzner 2009: 966-967; Rajablu, Marthandan & Yosoff 2015). Stakeholder management contains the processes to *identify stakeholders*, *analyze*

stakeholders and *develop strategies* for meet stakeholder requirements and expectations (de Oliveira & Rabechini 2019).

To efficiently identify stakeholders, problem or issues should be defined. When a problem is defined, can stakeholders be defined. (Chung & Crawford 2015) When stakeholders are identified, the analysis can be started. Stakeholder analysis is one of the crucial processes for project managers to build the right picture of the stakeholder environment (Aaltonen 2010). In the analysis phase, stakeholders are mapped, prioritized and classified. The importance of stakeholder management and especially stakeholder integration are kept as an important factor within the unattended change causes within projects (Zhao, Lv, Zuo & Zillante 2010). The study of (Butt et al. 2016) emphasizes the importance of stakeholder communication and integration within projects to avoid "rational and straightforward project culture where task performance and efficiency are preferred over stakeholders".

2.2 Stakeholder Reporting

Reporting, and especially project performance reporting for stakeholders is one of the key activities in communication management. Reporting can be considered to be a part of push communication where information is sent to stakeholders where needed information is extracted (Aurangzeab et al. 2016). Depending on contractual terms or internal regulations, the interval of reporting might differ between projects, but even monthly basis reporting generates workload for a project manager and related project employees. The main problem with reports is that projects usually tend to have progress, where the report data must be updated accordingly. (Piantanida, Cheli & Lorenzi 2011)

When planning reporting, the requirements of stakeholders must be identified to meet requirements and maximize gained value from reporting. According to the article of (Harvard business review staff 2016), the project reporting should present the actual status of a project to receive valuable support of project stakeholders if something in a project is not proceeding as planned or there are challenges. With the proper support of

stakeholders, issues can be together solved with the required phase. Reporting can be concerned as a continuous task, which is lasting through the project lifecycle and where its importance grows when the project team tends to be global (Muszńska & Marx 2019).

To succeed in an international and global project, trust is the one key attribute that must be built between different stakeholders. Cultural differences, use of technology and lack of face-to-face activities can impact trust, therefore it is crucial with reporting to support the level of trust through the project. (Daim, Ha, Reutiman, Hughes, Pathak, Bynum & Bhatla 2012) Muszńska & Marx (2019), identified general communication practices from strategic, informational and emotional perspectives. Nevertheless, building a general practice for communication and reporting is difficult because of the unique nature of projects.

Communication management practice category	**Communication management practice**
strategic (connected with communication planning and project environment)	S1 – clear lines and responsibilities established up front S2 – cross-cultural competence S3 – high-quality communication planning S4 – adopting common working language among team members
informational (regarding generation, collection, dissemination, storage, and disposition of project information)	I1 – shared virtual space/project knowledge center (website, wiki, groupware, project tracking software) I2 – instant messenger, e-mail, GoToMeeting – used on a daily basis I3 – traditional phone calls – used in urgent situations I4 – communication time schedule (especially for teams in different time zones) I5 – using various communication channels (for better convergence)
emotional (concerning the building of trust and relationships)	E1 – regular face-to-face communication, at least with the use of audio- or video conferencing E2 – encouraging team members to share feelings and chat informally – use of social media ('virtual water cooler') E3 – kick-off meeting, review meetings, stand-up meetings (kick-off should be a face-to-face meeting, others can be IT supported) E4 – frequent visits and staff rotation E5 – asking team members for advice, opinions, feedback

Figure 5. Selected communication practices Muszńska & Marx (2019).

The paper reporting, which means a report in the form of paper or document has been considered as a standard way of reporting in western countries. Nevertheless, in the era of digitalization, where digital infrastructure offers more possibilities, in terms of data

management, online reports are growing over paper reports. The main benefits of online reporting against paper reports are its reliability. When a paper is printed out and sent, the information is old. (Brown 2016) When talking about online reporting, there is impossible to define proper online reporting principles. Each company has unique projects where stakeholder requirements tend to vary. Benefits of online status reports are considered to decrease the workload related to communication and increase the satisfaction within report users (Maryland Department of Transportation 2013). There are several ways of conducting online reporting, where Power bi, QlikView SAP are well known with each has own strengths and weaknesses. With proper stakeholder evaluation and recognition of requirements, a report should be built to meet the expectations in a value-generating manner.

2.3 Development challenges in Global organization

Extending enterprise businesses and manufacturing in foreign countries is called generally as globalization, where the coverage of the enterprise area of influence is consisting of multiple different countries. One of the main consequences of globalization in project management is the multicultural environment, where project team members and stakeholders are representing various cultures and nationalities (Bartlett and Ghoshal 2003). Due to globalization, global project organizations tend to achieve possibilities and challenges from global changes (Yong & Javalgi, 2007). From the risk management perspective, international projects are riskier than domestic counterparts. (Abyad 2017)

When projects are managed and delivered globally, the importance of certain areas in project management increases. Integration of project management, cultural, economic, political and legal aspects, planning and controlling increased meaningfulness within global projects are highlighted in the study of (Mueller, Riedel & Simon 2008).

According to the study of Niazi, Mahmood, Alshayeb, Riaz, Faisal, Cerpa, Khan & Richardson (2016), the most frequent challenges of global project management are lack in cultural understanding, communication, management of time differences and knowledge

management and transfer. Project managers in a global project tend to have difficulties in handling cultural differences among projects (Wesslin, Linna, Jaakkola 2011). In practice, in some cultures, people are not speaking before asking to speak (Ebert, Murthy & Jha 2008). These cultural differences tend to generate problems with communication between stakeholders, where extra challenges are generated from people not using a native language (Setamanit, Wakeland & Raffo 2007). The lack of communication reflects the sites or offices which are across the globe. Naturally, this aspect generates challenges and problems in development (Niinimaki, Piri, Lassenius & Paasivaara 2010). The importance of communication skill is therefore crucial in global development projects (Clerc, Lago & Vliet 2007)

Challenges	Freq. (n = 101)	%
Lack of cultural understanding in teams	63	62
Lack of communication	54	54
Lack of management of time differences	42	42
Lack of knowledge management and transfer among teams	38	38
Lack of co-ordination	35	35
Lack of trust	34	34
Geographical distance	28	28
Requirement engineering activities	28	28
Lack of control	27	27
Lack of team awareness	23	23
Change management activities	22	22
Lack of a uniform process among different development sites	19	19
Allocation of tasks	18	18
Conflict management	17	17
Cost and effort estimation	15	15
Integration activities	14	14
Risk management	14	15
Lack of proper IT infrastructure	10	11
Protection of intellectual property	8	9

Figure 6. List of challenges identified in study of Niazi et al. (2016).

Lack of management of time differences refers to the different time zones, where meetings, and business work are scheduled in different parts of the local day. The challenge is overlapping business hours and problems to have synchronous communication between people (Tariq & Khan 2012). The lack of knowledge management is related to the high staff turnover rate of offshore locations. The proper knowledge transition is crucial for project transition and in the cases where new employees are joining in. (Bhat, Gupta & Murthy 2006)

Generally, global projects are vulnerable to uncertainties affected by the host country (Ozorhon, Arditi, Dikmen & Birgonul 2007). Within this, researches have been identified key factors affecting the success of a global project which are: political, legal, economic factors and cultural issues (Abyad 2017). Project management is also considered as proven method or way to completing complex tasks that have dedicated time to complete and defined budget. Benefits of project management are considered as cost-saving, decreased amount of rework, increased return and immaterial benefits, for example, improved management and organizational culture. (Lappe & Spang 2013) The case study of Lappe et al. (2013) found that investments in project management are beneficial and profitable. Investments into optimization, methods and initiatives to standardize project management created positive results as quantitatively and qualitatively.

2.4 Summary

Project management is acknowledged as the core of project-based manufacturing, where all deliveries are managed by project management. Within projects, project managers are responsible for delivering projects on time with high customer satisfaction. Therefore, it is obvious, that "the value added to a project by the project manager is unique; no other method or process adds similar value" (Stephensons 2008). When project managers are in the centrum of project management and delivery process, the personal skills of project managers are impacting to project success. According to (Hauptfleisch & Siglé 2004), "the project manager very specifically requires leadership skills and not only management ability". The same conclusion can be acquired from the article (Mabelo 2011), where project managers who are lacking skills are a "common cause of project failure".

To ensure and support project managers work with projects, an extensive theoretical framework has been established around the project management. The theory is built upon knowledge areas. Some of the knowledge areas tend to be present in each project and some not. Therefore, for project managers, it is important to acknowledge the theory and apply the necessary methods and tools to correspond to the current project.

Due to the growing trend of globalization, nowadays projects tend to be global where the project team, supporting aspects and stakeholders are in separate locations around the World. The scope of projects has been grown and the projects are challenging due to bigger scope and increased complexity, more people are participating in projects. Without the global aspect, projects are hard to manage but when the effects of globalization are added, projects tend to be more challenging. The theory of project management gives us a good foundation of understanding about the core project management, but the challenges and possibilities of globalization are not taken into account.

Globalization brings many extra challenges for the project team. The skilled communication is needed to make sure that every participant is doing the right things and the flow of information goes to each direction. Cultural effects cannot be forgotten, and people must be encouraged to speak. Time can be different in another location and the careful time zone management is also needed to ensure the best time slots for everybody. Due to globalization people must stretch and make compromises. A project manager has to carefully evaluate all of these aspects and more. What is the economic and political situation in other countries?

Globalization and global teams encumber project teams and organizations and are adding workload even more on challenging existing projects, how the company, organization, processes and tools are supporting the challenges that come from globalization? To correctly ensure the sustainability and efficiency of project management, even in a global environment, continuous development is needed to answer the changing need for different ways of working, tools and processes. The development should study, highlight, interview and make proper actions towards the state, where the additional aspects of globalization are considered within normal work.

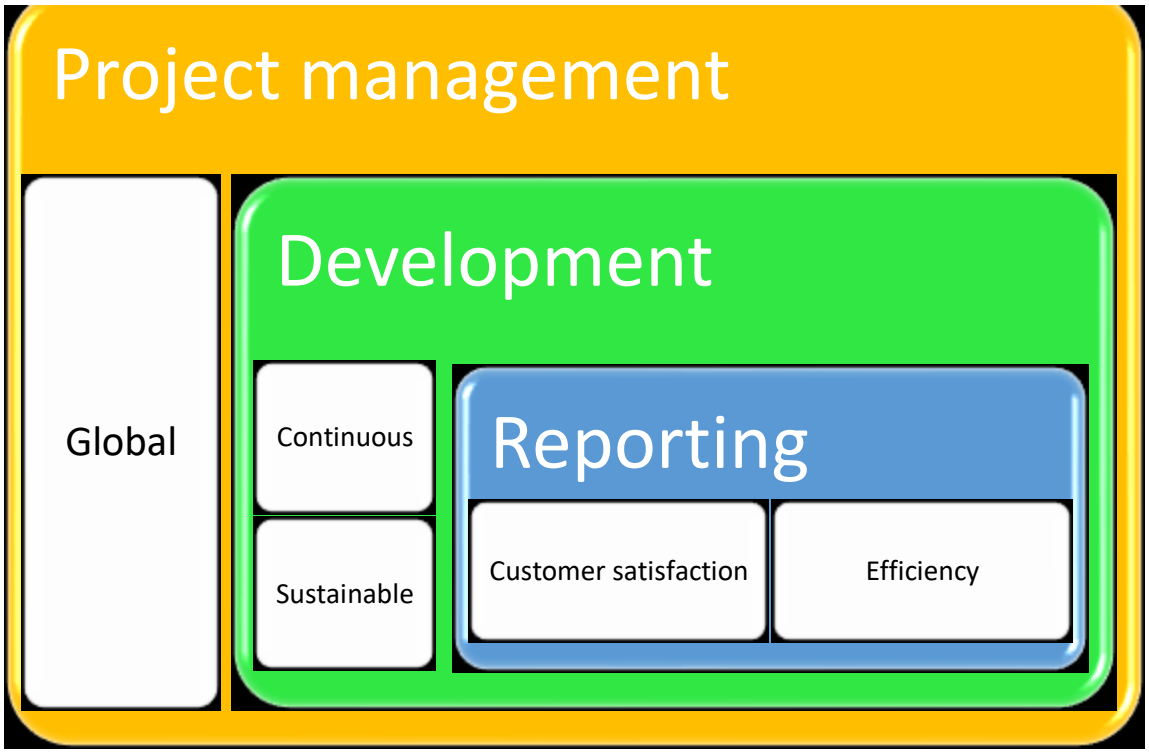

Figure 7. Relationships of project management, development and reporting.

How this can be done? One main consequence and problem of globalization was lack of communication management, which means that the flow of information is not handled enough well. People are not getting the information on what and when they are needing it. Usually, this information is sent through different kinds of reports, which is also known as a push method in terms of communication management. If we have already paper reports, why we need something better?

Because of the digitalization, more data is stored in ERP and other related systems. This data is copied and moved to the paper reports, which are then sent to the stakeholders. Why this is done nowadays? At the same time when data is copied from the ERP system, it is old. Therefore, creating a report with an integration to the ERP or other relevant systems, and publishing it to the online where everyone who needs to see it is, will have to create an impact on the need for communication. Business hours are different in different locations, people are sleeping when others are working, when the up to date data is

available in online and people are getting it whenever they are needing it, surely it will generate satisfaction, efficiency and success.

3 METHODOLOGY

In this chapter, the research approach and used methods are presented. This research objective was to study the challenges of the target company's project management in a global business environment and identify possibilities to increase the efficiency of project management. More specifically, the areas of project management are identified, which are crucial in the target company and recognize in which area, immediate development is required and to improve internal and external processes and tools towards customers where additional value for the customer can be created easily.

While optimizing the project management, not only the customer gets additional value. When Internally project management progress is smooth and common rules are applied within project management, the increase in efficiency is significant when observing the whole lifecycle of the project. This can be especially seen if project-related data is commonly stored in a commonly known place, the live cycle support organizations are more likely to obtain benefits to sell more precise life cycle solutions when the basic data about the project is available. This eventually saves precious time, which is crucial for bigger companies, which tends to be the only resource that is unreplaceable.

3.1 Research approach and strategy

To have a logical and structured strategy for methodology, the research onion model by Saunders, Lewis & Thornhill (2009) was exploited (Figure 8). The onion model gives a clear presentation about the areas of methodology and with the help of the onion model, the methodology is structured logically. The onion model will help to define the most important aspects of the research process and therefore eases to understand the progress of research.

The research strategy was built based on the case study methodology, where interviews, observations and literature are used to build the present state of project management in

the target company. When the overall view is established, the answers to research questions are formed as results of this study.

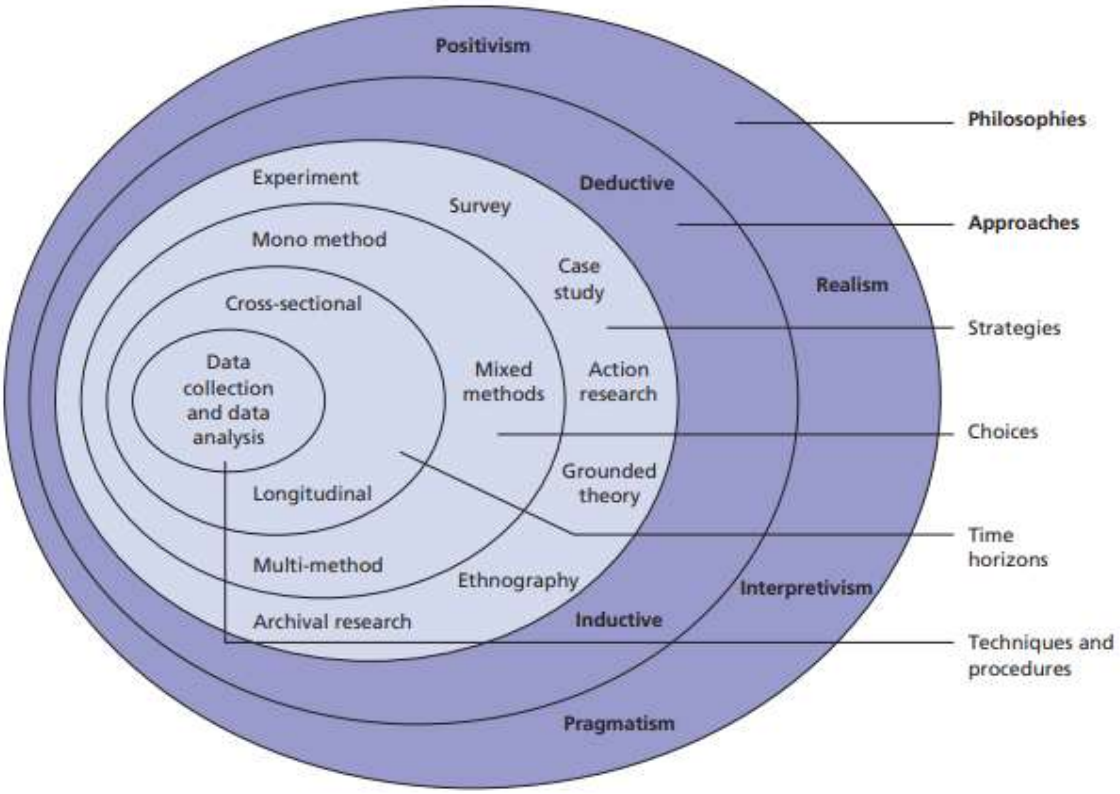

Figure 8. The research onion model. (Saunders, Lewis & Thornhill 2009)

The most suitable research philosophy for this research is interpretivism epistemology, where the ontology of this research is the reality, which is formed based on the actions and perceptions of a social actor. These actors are producing reality through everyday actions. This means that multiple versions of reality are defined according to each actor. (Sandberg 2005). The selected philosophy is often linked to qualitative research where in-depth investigations and small samples are used. (Saunders et al. 2009) The approach of research is the second layer in the onion model. The approach used in this research is the deductive approach. In a deductive approach, a theory is collected and then empirics is done within the case study context. There is a large collection of studies concerning project management, but because of the definition of project and project management, a

qualitative study is also required to identify the target company's specific attributes in project management.

3.2 Research design

Research design is the plan of the research. Sanders, Lewis & Thornhill (2007) defines the research design as *"the general plan of how you will go about answering your research questions(s)"*. The research design includes the strategy, choice, time scale and techniques and procedures of research. The research question for this research is: "*How mature the project management is in the target company and how the maturity can be improved with processes and tools?*". An important part of the research strategy and design is the consideration of the purpose of research. The research purposes are three different kinds; descriptive, explanatory or exploratory. Explanatory research uses "*why*" and "*how*" questions to examine the problem. The goal is to define and explain the relationship between variables. According to (Yin 2014), a case study is commonly used in this type of study. Because the research question includes "what" and the thesis scope is observing only one company it is logical to use the case study as a research strategy.

The Case study is defined by (Robson 1993) as, "a strategy for doing research which involves an empirical investigation of the particular contemporary phenomenon within its real-life context using multiple sources of evidence" Yin (2014) defines four different kinds of case studies; holistic case, embedded case, multiple case and single case. This study concentrates to observe and research project management in the target company. Therefore, a single case study is obvious for this thesis. However, the thesis aims to find potential development topics within project management in the target company and find the maturity level versus importance, the aspects of exploratory studies are also present.

The empirical data of the thesis is gathered mainly with interviews. Usually, the non-numeric data, observations or interviews, for example, are considered as qualitative data. All interviewed persons are working within project management in the target company. To get an extensive view of the maturity of project management, interviews are from

different countries, cultures and positions. The experience level has also considered and both, experienced and un-experienced employees are interviewed. The interviews are aiming to answer the empirical research question: *"What challenges project management organization encounters in the global environment?"*. This thesis observes the sample data from interviews that are conducted only once. Because of this, a cross-sectional design was selected as a time horizon of research.

3.3 Data collection & Process

As mentioned in the previous chapter, the empirical data was collected through interviews. The data is extracted from live and phone semi-constructed interviews. Eriksson & Kovalainen (2008) defines the three different ways to conduct interviews, structured interview, semi-structured interview and unstructured, informal and open interviews. A common guideline for structured interviews is planned in detail and questions are defined precisely. The questions in each interview session are the same, and the goal is to compare answers. Because, this thesis is not comparing the data, moreover, searching for answers to questions, structured interviews cannot be considered as the right method to be used in interviews.

The unstructured interview is the opposite, where interviews do not pose any clear structure or strategy. The unstructured interview tends to freely move to different topics and therefore, requires interpersonal skills from an interviewer. For this reason, this method was not considered in this thesis. The last interview method is semi-structured, where is concentrated to present "how" and "what" questions. Outline topics and overall them for interviews must be established, where the wording of the questions and order can vary during the interview. Semi-structured interviews give the interviewer to present additional questions and react to answers. A Semi-structured interview is also considered to support qualitative analysis. For these reasons, the semi-structured interview method was chosen for this thesis to collect the main empirical data. (Eriksson et al. 2008)

Most interviews were conducted by skype, because of the location of respondents. The language used during interviews was Finnish and English, depending on the native language of the respondent. All interviews were conducted during autumn 2019.

Within the target company, 10 interviews were conducted with live and skype interviews. The internal interviewees were from Europe and Asia and represented project managers and engineers. More specific information about the interviewees can be found in table 1.

Interviewees were chosen by randomly sampling the people working in the project management department, approached privately with face-to-face or with email depending on the location of each interviewee. To get accurate results from interviews, it was decided to exclude names and precise titles. Also, the atmosphere of interviewing situations was kept as relaxed and openminded where interviewees were encouraged to give constructible feedback about the different subjects regarding their daily work. When interviews were kept anonymous, the interviewees were able to answer without fearing to have possible consequences. Target was to have interviews from different countries, where a possible cultural difference could be observed because the target organization is global, the impact of globalization must be exploited.

Another important aspect was to have people from different positions. Project managers and project engineers are the main persons who are working with projects in the target company. Therefore, people working in these two roles are the most suitable persons as an interviewee. When collected data comes from a group where experience, role, education and country vary, the accuracy of results can be maximized, and observation is done from various angles.

Table 1. Background information about interviewees.

Respondent code	**Location**	**Role**	**Experience**	**Education**
IFI1	Finland	Project manager	14 years	PMP
INO2	Norway	Project manager	5.5 years	Short PM related courses
INL3	Netherlands	Project engineer	20 years	Internal courses
INL4	Netherlands	Project manager	7.5 years	Internal courses
IFI5	Finland	Project manager	13 years	PMI certificated associate
IFI6	Finland	Project engineer	5 years	B.SC minor from international project management
ICN7	China	Project manager	9 years	PMP
IIT8	Italy	Project manager	10 years	PMP, internal courses
IIT9	Italy	Project engineer	10 years	PMP & University courses
IKR10	Korea	Project manager	7 years	PMP, internal courses

The interviews took place during autumn after the summer holidays in 2019. Persons located in Finland were interviewed face to face and the rest of the interviews were conducted via Skype. Each interview was arranged in a private meeting room to ensure a quiet place where the required privacy was possible to achieve. Each interview was reserved for a 1-hour slot, but depending on the progress, the length of the interview could be extended. During the interview, answers were written down and after the interview session, answers were finalized and sent for interviewee review and approval.

Depending on the nationality of the interviewee, the language was either Finnish or English. The questions were divided into four categories, which were formed to get an extensive view of the maturity of project management in the target company. After the approval of the interviewee, transcribed answers were analysed.

3.4 Data analysis

Data analysis is the phase where the intended data is collected. Data analysis's purpose is to observe the collected evidence accordingly while avoiding bias. To analyse data appropriately, absolute objectivity in the analysis phase is required. Data reduction is a concept of data analysis, meaning the sorting of data, re-organizing and focusing it. Another concept is data display which means that collected data is presented reduced and organized appropriate way while following a professional manner of data analysis. The output of the data display is a conclusion drawing which summarises the data together. (Miles & Huberman 1994)

The data reduction phase contained the review of interview transcripts, exploit and recognize common patterns. Collected data should then reflect theory where the aim is to have common concepts with gathered literature. Nevertheless, this was found as an artificial as a result of the project management nature where each project can be unique. Therefore, instead of reflecting literature, it was more convenient to proceed. The data reduction phase is followed by the data display, which means categorizing and establishing relationships between identified patterns.

3.5 Reliability and validity

When the research concentrates to investigate process where people are heavily involved in their daily working environment, qualitative research is the most suitable approach. With qualitative research, the researcher can have a view of people's lives and have an imagination about things and conditions that people might encounter. (Yin, 2016) Research data must fulfill the reliability and validity of data to be accounted for as credible research. According to Saunders et al. (2007:150), research can be defined as reliable when "*data collection techniques and findings will yield consistent findings*" and the validity is defined as "*the relationship between two variables*".

During the research, the data collection method intended to get as various samples as possible. From table 1, we can see the four identified background attributes, which might affect data. Therefore, the sample consisted of persons from different countries, with different positions, experience and education background. Because the target organization was highly global, this sample might not present the whole picture and therefore it might influence the consistency of this research. There might be also possible that if the sample group would be different, the acquired results might also be different, due to the background, experience and position variances. Additionally, it is important to highlight the nature of project management and remember that each project is different.

The interview questions were similar within the sample group and during interviews, questions were opened if the interviewee did not understand the question accordingly. Therefore, results can be considered as consistent within the sample. To adduce the reliability of the research, the sample collection methods are described in a sufficient level of accuracy and straight quotes are used to promote the transparency of interviews.

Saunders et al. (2007) have listed the common challenges of reliability as following: Subject of participant bias, observer error, observer bias and subject or participant error. Additionally, Saunders et al. (2007) describe challenges of validity as testing, instrumentation, mortality, history, ambiguity and maturation.

To ensure validity and reliability, the referred literature was collected from official academic publications, published books from well-known authorities and journals. When the referred literature is from globally approved authors, the reliability of the thesis is ensured. Interview questions were the same in each interview, and the interviewee's understanding was ensured, and more specific descriptions provided if questions were misunderstood.

After interview sessions, recorded answers were confirmed from the interviewee to commonly agree with the interview output. To tackle bias, a common understanding of the purpose of the research as well the anonymity was ensured and confirmed with interviewees. With these actions' reliability risk was controlled and the possibility to have problems with reliability was decreased.

For controlling problems with validity, the test setup was detailed described in chapter 3.2. Because of the nature of the thesis, and limited duration, the validity problems concerning history are not relevant. To reduce challenges with testing, the interviews were anonymous, and background information was modified to ensure the anonymity of interviewees. The anonymity decreases the negative impact of study results for interviewees and encourages interviewees to answers honestly. Nevertheless, the testing challenge is not handled completely, but at least noticed and take needed actions to minimize the risk related to testing where interviewee concerns that research results have negative results for interviewees.

Validity problems with instrumentality were not concerned and a big challenge. All respondent was experienced in are of project management and each one had an educational background from project management and respondent were answering questions related to their personal experience and observations. Mortality is excluded because each interviewee who was invited, also participated. In the case of maturation, respondents were selected randomly asking eagerness to participate. To exclude the maturation problems, persons from different positions and countries were chosen.

Ambiguity was identified as the biggest challenge in the area of validity because all respondent was experienced in the area of project management, so the thesis does not cover the area of how people with no experience would answer and consider the situation of project management in the target company. These positions are challenging in the target company and therefore, people working in project engineer or manager usually poses experience from project management. Therefore, the results of this research are suitable for the current situation because no significant changes in the requirements of these positions are not identified.

4 RESEARCH FINDINGS AND ANALYSIS

In this chapter, the case company is introduced, and the overall structure is described. After the case company introduction, the main findings from interviewing's are presented. Direct quotes are used to increase the transparency of interviews. At the end of this chapter, findings are analyzed and compared with literature.

4.1 Case company

The thesis target company produces high-quality Power related solutions for Marine business. Solutions are named "Customer delivery projects" and the Project management organization will be mainly responsible for managing these customer delivery projects. Due to recent organizational changes, when separate business lines merged as a single big organization where project management units from each main business line are merged into a single project management unit. After merging, the project management unit has over 300 personnel and from over 10 countries globally.

Projects which new project management unit manages are usually bundle projects. This means that project can include several target company's products. The products can be related to propulsion, engines, exhaust gas cleaning systems or power conversion systems. These products are manufactured all over the world, for example, engines depending on the model are manufactured either in Finland, Italy or China. While products are manufactured in multiple countries, it increases the complexity and the need for real-time communication, up-to-date information and unified processes increase significantly.

"The customer is the king, and the contract is the queen" (Berglund 2019). In the target company, the project is succeeding, when a project is delivered within the promised schedule, costs and customer is satisfied with the ordered top-quality solution. The project manager's main responsibilities are to steer the wheel of the project in the right direction with the data and information provided by different functions of the project team. But most of the time is going to use and update the different software's. This has led to the

situation, where project managers are not gaining actual benefit from existing software's and instead of gaining support, project managers are supporting other functions by providing data about the projects. The main mission is to follow the contractual terms and satisfy the customer, which is usually the yard constructing the vessels.

4.2 Findings

In this chapter, each section and question are explained, and the results are summarized. There were four main sections: Background, Project management, Development and customer reporting. There were 18 open questions. To improve transparency, direct quotations are used to highlight the most centric findings. With these 18 questions, this research aims to find an answer for: *"What challenges project management organization encounters in the global environment?"*

To fulfill validity and reliability requirements, the background information about the respondent group is required to identify the source of collected data. Background information provides crucial information in the analysis phase and reveals possible dependencies between answers and background. The background section included questions related to the country of living, position/role, experience from project management, and overall mapping about the organization. The background section included also the description of the target of research and description of the anonymity and structure of the interview. General respondent information can be seen in table 1.

The background section included questions regarding the current organization structure. The current organization is formed around two geographical areas, where are area directors. Under areas, are managers or general managers who are responsible for certain countries. Under this managerial line are project managers, resource managers and project engineers. From figure 9, can be seen the general level of area organization structure.

Figure 9. Area-based organization structure.

Overall area-based organizations were considered a positive thing, which enables the target company to concentrate on specific countries and cultures. This, of course, increases the value provided for the customer. Also, the current setup is enabling to get to know colleagues better, because certain people are working within specific areas. Nevertheless, the areas are not strictly fixed, which gives certain flexibility as well as possibilities to acquire new challenges.

"The area organization is good at the moment. The main benefit of this structure is that we can concentrate moreover on certain countries, cultures and time zones. Another benefit is that project personnel will get to know their team members much better."

As negative sides of the current setup were the lack of support of the supportive functions around the project management. Project management tends to be between the customer and supportive internal functions which might affect the motivation of these functions. More transparency from internal processes towards customers was highlighted. The role of area mangers was also disputed. People consider the role of area managers moreover as a supportive role, not a motivator. Therefore, area mangers should have enough authority to support and escalate things if needed to achieve the goal of the project.

"About the organizational structure, it feels that we have too many manger lines, who still might lack an authority to support enough project managers"

Another highlighted problem was the lack of one uniform Way-of-Working (WOW). Even though the concentration from a certain product is moved to the solution level, there still exist product-specific WOW's which might generate internal problems. This is also considered as confusing because all should be one organization and should follow uniform WOW. Summarized findings can be seen from figure 10 below.

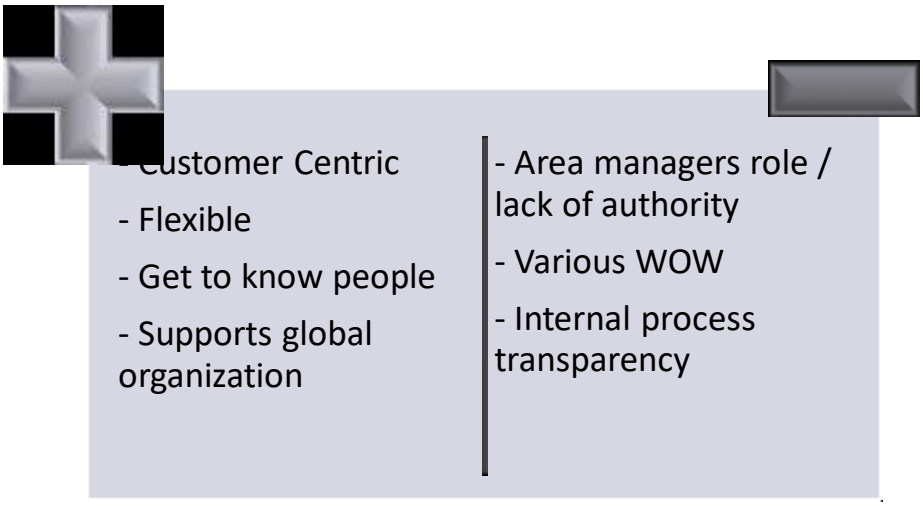

Figure 10. Summary about the findings concerning organization structure.

4.2.1 Development in Project Management

The project management section's purpose is to exploit in detail project management areas, which are considered as important areas in the target company's project management. Another purpose is to identify possible areas where further development, from the perspective of tools and processes, should be done. Project Management Institute (PMI) has defined 10 knowledge areas of project management, which can be seen in figure 11.

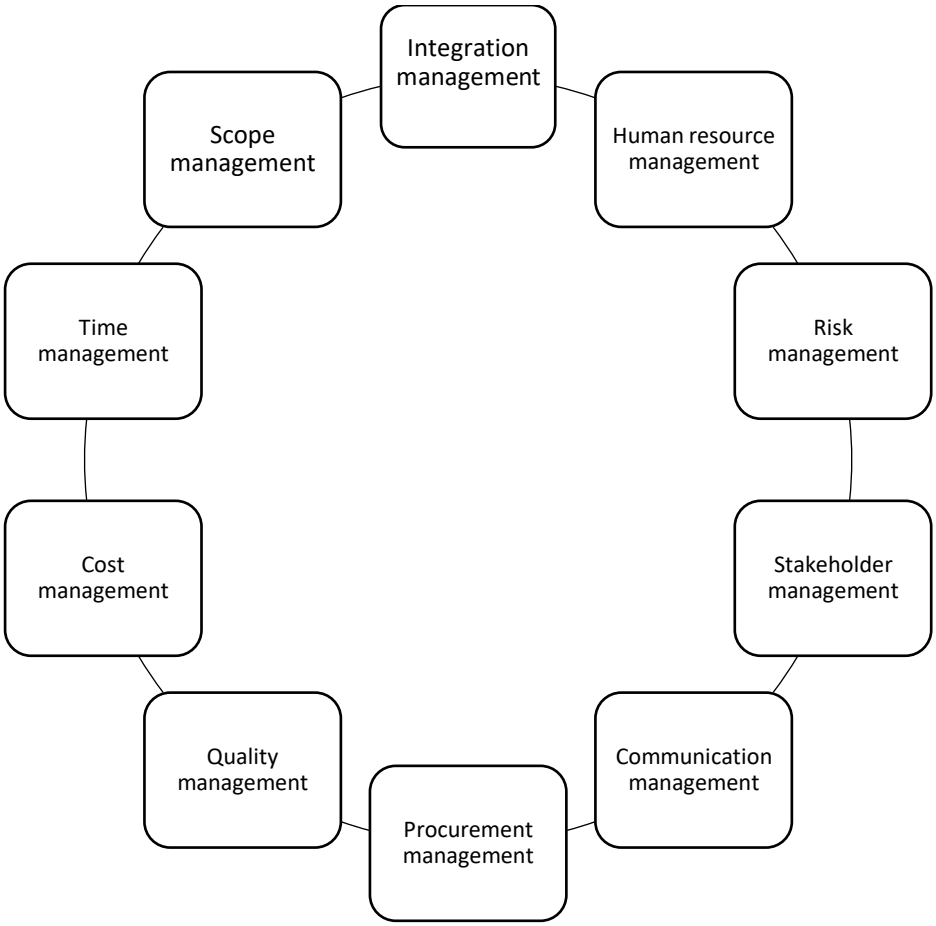

Figure 11. Ten Knowledge areas of Project Management defined by PMI.

The first questions were considering the roles of project managers and engineers. The target was to have a view if roles are uniform across the project management department globally. Based on the answers, roles are defined well enough to have a clear understanding of the role of project manager and engineer. Some respondents were unsure about the extinct of official role definitions and where definitions could be found. There was not a clear variance between roles and country, which indicates that a role definition is clear globally.

"Project manager is responsible for the contract content and knowing your client. When the scope is clear, you have to deliver the agreed items within the required quality standards and schedule. "

All interviewees highlighted the aspect that roles are defined and therefore role should be fixed, but practically the role is depending on the project and about the project team. Especially different WoW in different product lines is affecting challenges and confusion. Some respondents were concerned about the lack of global authority to ensure the implementation of WoW and connecting support functions into project management. As an example, Project Management Office (PMO) could be considered as a solution for this challenge.

"There is an official definition for project engineer role. But sometimes there are situations where the lack of PMO can be seen. For example, PMO is acting as a link between projects and support functions."

The last aspect of the roles was the responsibilities, how responsibilities are defined and divided. It seems that overall responsibilities are defined well and commonly agreed but lack of contact person information for nominating project team members is causing difficulties. Sometimes there are also situations when it is hard to find people responsible for certain things and this is considered a waste of efficient time.

One part of recognizing the possible development topics is to exploit activities which are creating workload. Respondents were asked to name three activities, which are consuming most of the daily time. When answers are summarized, the following activities were considered the most time consuming:

- Meetings
- System design
- Stakeholder management
- Unexpected priority things
- Internal communication
- Project follow-up

- Project technical information
- Outsanding actions follow-up
- AdHoc Tasks
- Maintaining different systems
- Progress reporting
- External Communication
- Component purchasing phase
- Gathering documents
- Technical specifications
- Deliveries
- Technical questions
- Project planning

Communication and stakeholder management was the most recent activities which were named to be most time-consuming. These both are including internal and external communication. Many of the activities can be considered to be normal project management activities which can be included in PMI knowledge areas. Nevertheless, some activities, for example, maintaining different systems are not part of the knowledge areas and could be identified as one possible development topic. Reporting should neither be time-consuming, but instead reporting should be done automatically, straight from the system, therefore reporting can be identified as second developed area.

In the next question, the interviewee was asked to name three most important PMI knowledge areas that they consider to be the most important ones in their position and the following question was concerning the present status "*how current tools are supporting you within these areas?".* The target of these questions was to recognize crucial areas and

in parallel, see if the same areas are named globally in both positions. If certain areas are identified globally, naturally these areas should be reviewed carefully from the perspective of development. The summary from the answers can be seen in table 2.

To understand, how these identified knowledge areas are handled in the target company, the following question asked to describe, how well-identified three knowledge areas are supported by tools and processes in the target company. From table 2, it can be seen, that scope, time & cost were considered most frequently as important knowledge areas. In terms of cost management, part of the respondent considered Cost follow-up function in SAP to be enough in the cost management area. The rest of the respondents were hoping for more development in the cost management area.

"For schedule, there is at the moment only master level and for component level, there is no tool for following that aspect."

For time management, the currently developed tool was seen as a positive thing, which would cover the time management area well enough. Currently, private excels were used to build a schedule for the project and the need for tools in time management is high. In the area of scope management, the first need would be a tool, where could be seen in the overview of projects and products, which are included in projects. Now project managers and engineers can have several projects to be handled at the same time, which creates the need for overall view.

"The only tool in the cockpit at the moment, which enables the overall picture of my projects. Currently, I am not able to get the whole picture from other tools."

Table 2. Summary from identified PMI knowledge areas.

	Areas considered as important	Areas to be improved
Integration Management	1	3
Scope Management	5	4
Time Management	5	1
Cost Management	5	6
Quality Management	4	3
Procurement Management	-	3
Human resource Management	-	1
Communication Management	4	1
Risk Management	4	4
Stakeholder Management	2	4

Another relevant group on knowledge areas were Communication, Risk, and Quality management. Interviewees who named communication as important knowledge areas

thought commonly that there is room to improve in tools and processes when talking about communication. The lack of common processes for reporting, communicating and sharing information were highlighted. Another concern that was considered to decrease the efficiency of communication was the lack of commonplace where project-related data would be stored.

"At the moment often the project manager has to ask separately status update and information from supporting functions, so tools and processes do not properly support the information flow from supporting functions towards the project manager."

In risk management, interviewees were not seeing any relevant tool or process to manage risks. Risk management is mostly concentrating to follow the money flow of the project and the main risk is controlled with down payments. For quality management, interviewees saw that quality is the main aspect of project management. One highlighted aspect is that project management has moved moreover towards customers from products, which will create possibilities, as well as challenges in, are of quality.

"Cockpit and soon the checklist function in it are essential for PM, helping to keep the contractual commitments and sometimes triggering inquiries to a customer of schedule validity."

To reveal areas, where possible development in tools and processes should be done, the next question was concerning PMI knowledge areas and in which areas, interviewees saw the opportunity to have development done. Interviewees named three potential knowledge areas and results can be seen from the right column of table 2. Most of the interviewees concerned Cost management as an area where tools and processes are needed, other important areas were stakeholder-, risk- and scope management.

The final question in the project management area was concerning the changes in project management and how interviewees are seeing the change while they have been working in the target company. Overall, interviewees were sawing big changes during their time in project management. The biggest change which each respondent was stating was the

transformation from product-centric to moreover customer-centric organizational structure, which is known as an area structure. Before, project management was formed around the products, where each product line had own project management. Other notable changes that interviewees highlighted were the changes in the internal focus areas. There have been several different focus areas which are changed when new challenges have appeared. Most of the interviewees were complaining about the speed of transformation and the lack of time to ensure proper implementation of each change.

"The positive thing nowadays is the localization, meaning that Project management is closer to the customer than before and the negative is the speed of changes, especially in organizational level."

The target of questions related to development was to examine how the development team has been doing development from the perspective of project managers and engineers. In the area of development, one critical aspect is the actual implementation of the developed thing. How you communicate and manage the process and achieve the successful implementation of newly developed things. Also, it is crucial to understand, the locational aspects and how it is affecting the successful implementation. In question, the development team is concerning the Quality & Documentation team.

Currently, there are two development types within the target company, The OE and operational development (OD). The OE related development is done within specific waves that have the defined start and end date. The duration of the OE wave is determined as 100 days. The OD does not have a fixed duration or specific start and end dates. OD is mainly done with the time and iterative process is commonly used. Many time-consuming tool development activities are concerned mainly in the area of OD. The main characteristics of these two development approaches can be seen in figure 12.

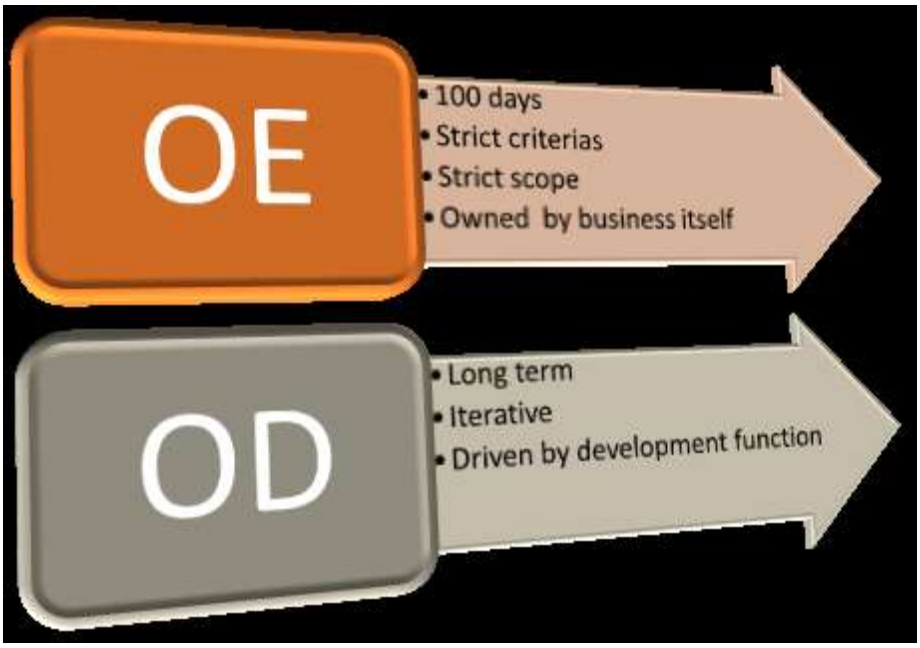

Figure 12. Definitions of OE & OD

The first question was considering the development team's support and guidance towards the project personnel, practically how the development team has been succeeding in supporting and training new things for end-users. The questions were formalized in the way that possibility for interviewer bias is minimized. Another aspect was to collect overall feedback from project managers and engineers when there is no organizational superior setup present. All interviewees were agreeing that the current support and guidance provided by the development team are at a good level and no actions needed in that area. Ongoing development was seen as important, and results have been concrete, which means that results can be seen on the operative side as well. Some interviewees were concerned about the speed of Operational Excellence waves (OE) and where considering that 100 days are in some cases insufficient.

"The development has been good, especially within tools. The guidance and support have been at a good level, but for the cockpit, the overall responsible matrix would be a good addition."

The next questions were considering the transparency of development. To succeed in development, the purpose of development must be clear. For this purpose, persons from

operational and end-user levels are invited to take apart in development. The transparency of development progress and ideas are crucial for end-users to whom the actual development will affect. Moreover, when ideas are communicated clearly, these persons can provide their valuable knowledge about certain aspects of what the development team has not considered.

The answers were well balanced, apart from respondents were considering the transparency as enough, when another part was requiring more transparency and overall mapping from ideas and development initiatives. The following question was considering the willingness to participate in development initiatives. Most respondents were interested to participate in the development, where a couple of interviewees was not sure would they like to involve. The most common reason for unsureness was the development topic and is it interesting. Some respondents were also highly involved in the development and were considering letting others participate as well.

Table 3. Willingness to participate into development initiatives.

	Yes	**No**	**Maybe**
Respondents	4	1	5

The last question in the area of development was to get an overall picture of, what people are expecting from the development team. The expectations from the operative side are important to acknowledge because then actual development can more efficiently be concentrated to support as expected. Generally, people were expecting the development team to find more efficient ways to do things as before, supporting and communicating closely with project personnel. Requirements to collect more efficiently feedback and lessons learned from "the field" were highlighted.

"They would find one single tool for project management."

4.2.2 Stakeholder Reporting in Project management

One possible area, where significant development can be done from the target company side is reporting towards the customer. Often reporting requirements are coming from contract level, therefore reporting is an important aspect that should be done within contractual terms. The purpose of questions related to reporting was to map the possibilities to develop reporting to be internally more efficient and more informative for customers.

The first question was asking about the common customer requirements about reporting. In the below, the summarized list from answers can be found.

- Schedule with milestones
- Actual current status
- challenges
- Engineering status
- Documentation status
- Changes in delivery process
- Project plan
- Open tasks for both parties
- Actual pictures from manufacturing
- Quality related things

The second question was exploiting ways how the current interviewees are reporting. Commonly interviewees are reporting according to the customer requirements. Even

though the target company has own reporting template, according to interviewees, it does not fulfill the common requirements of customers. Moreover, people tend to have individual reporting style where different templates and software are used to create reports.

"At the moment project managers tend to have their template and styles for a report to the customer."

When asking the opinion of respondents in the following questions, that are different customers requesting the same kind of reporting in terms of content, bigger customers tend to have more comprehensive reporting requirements than smaller customers. According to respondents, smaller customers might even be satisfied without any standard progress reporting. The standard reporting template was considered to be a working solution in terms to satisfy globally general customers reporting requirements.

"Some customers are not requesting any reporting and some customers especially big yards are requesting detailed reporting about everything."

The last question was exploiting the content what the reporting template should at least contain. The most frequent aspect was the basic schedule, which is connected to the target company's milestones. Another important aspect was open to internal and external tasks. The report should contain also information about any issues occurring, contact persons, freeze points, required documents, risks and schedule for down payments. Interviewees highlighted the importance of displaying the progress against baseline neither than showing progress in percent.

4.3 Analysis of project management processes

The fifth chapter is analysing the results and findings from interviewing's as well as suggestions based on the results. The first area of questions was concentrating to gather background information about respondents and organizations.

Because of the nature of the project and generally projects are considered as an individual, where each project is a single with own characteristics, it will be difficult to accurate analysis how the background is affecting to the answers. Nevertheless, the interview questions were concentrating on moreover questions, where might have locational or cultural aspects. After all, projects are managed globally in the target company and project teams can have multicultural.

The most relevant question in the background section was the question related to the organization. All respondents agreed that the current, area-based organization is a good thing, especially from the customer viewpoint. The current setup is still relatively new, so time for change is needed to see the complete results. The biggest concern which comes with area organizations is globalization and integration related aspects.

With area organization, teams tend to be global. Due to historical reasons, different product lines might have different WOW's, which is affecting difficulties for a lead project manager. It will increase the workload of the project manager to get to know each WOW, know the product and take care that the scope is aligned internally. The lack of integrational function and tools is creating high risks for the company and projects. The respondents were stating that the role or function of integration is needed to deliver projects as promised without a high risk of failing to meet the contractual requirements.

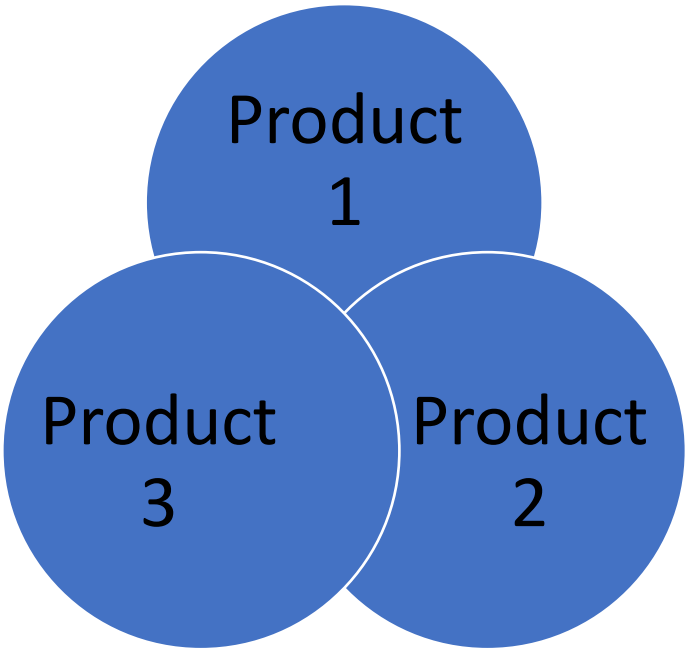

Figure 13. The sample solution project with multiple products

The integrational aspect has an impact on the success of the project, especially when talking multi-product solutions projects, where examples can be seen in figure 13. Solution project contains different products which must work as one integrated system, in figure 13, integration interfaces can be seen as darker areas. To have integration done efficiently within projects, clear, standard and globally agreed WoW must be established with enough level of transparency. This will support the lead project managers work, decreasing the required time to get known with new working styles, and increasing the effectiveness when time is concentrated for more productive work. These processes will decrease the authority of project managers, but as a trade-off, workload and possibility for negative risks will decrease, which eventually leads to more efficient and profitable project deliveries and it is aligned with case company global principles.

4.3.1 Analysis of development needs in Project management

The next set of questions were related to project management. All respondents were aware of their role, and the official definition. When talking about projects, where projects are unique, a precise definition of roles is hard to define because of the high dependency on the project team and individuals' competences. From activities which are consuming most

of the time, few aspects arouse; the first aspect is the need to maintain several different systems. The first aspect concerns the supporting systems within project management. The project personnel is upkeeping a lot of different, standalone systems which should not be the main activity of project manager or engineer. This time is always away from the actual management of the project. The main problem is that the main tools and systems are not integrated, and the same information must be placed several times into different systems. This challenge with globalization creates the need for more extensive and time-consuming internal communication.

Integration management is one of the main knowledge areas in project management (PMBOK 2017). The preferable situation from the project management side would be one single project management tool, which would be integrated into an enterprise resource planning system (ERP) and other related internal systems. Another option would that all internal systems should be integrated alongside each other, where would be achieved the situation where data input is needed only once, and the data would be available internally in other systems as well. When internal integration is not enough, it generates inefficiency and waste in internal processes.

The second aspect is with stakeholder management and partly technical questions, where the same problem with integration management applies. If the data for internal use is provided with one single interface, later this could be used for customer reporting. The optimal situation would be that all customer-related data could be provided for customers with the help of automated reports from where customers can check the latest project-related data. Also, the need for meetings would decrease or the duration at least, when data has been shared commonly for everyone, and accessible for everyone participating to project.

The main benefit would be the amount of saved time from reporting, increased customer satisfaction and because the data would be always live, a customer would always have the most recent data available Nevertheless, this does not mean that there would be only one database, but instead the level of integration between different systems and tools must

be higher. Therefore, when developing future applications and software's, the integrational aspect must be highly prioritized.

The majority interviewee recognized the time, scope and cost management as the most important areas within the target company's project management. These three knowledge areas are recognized as well in common literature as the main constrains of the project (Atkinson 1999). On the cost side, there is a clear need for a better solution to more efficiently handle the cost management. The new cost management Fiori application was considered the potential to fulfil the current need.

The second area where the need for better software or process is needed is scope management. The main problem appears to be a clear clarification of what the project is delivering for the customer. Currently, there is a gap in the common understanding about what has been promised and sold to a customer and what must be delivered to fulfill the contractual requirements. The main reasons for this gap are the lack of common agreement that what are products, what each business line is providing, and the most important, what the product contains. The need for better software or tool is not relevant, but moreover, higher-level agreement, how products are defined and what products are containing. When the overall definition is made, it is more easily globally to understand the sold scope, which eventually results in the delivery to be as per custom ordered.

The project-related data should be stored into one commonly agreed place where data would be available globally. The current problem seems to be that the data is already stored, but the lack of software's internal integration is not up to date to efficiently providing all project-related data in a simple overview. Therefore, more work must be done on the software side to ensure a smooth way to upkeep and add data related to single projects. The flow of information as a process level can be seen in figure 14.

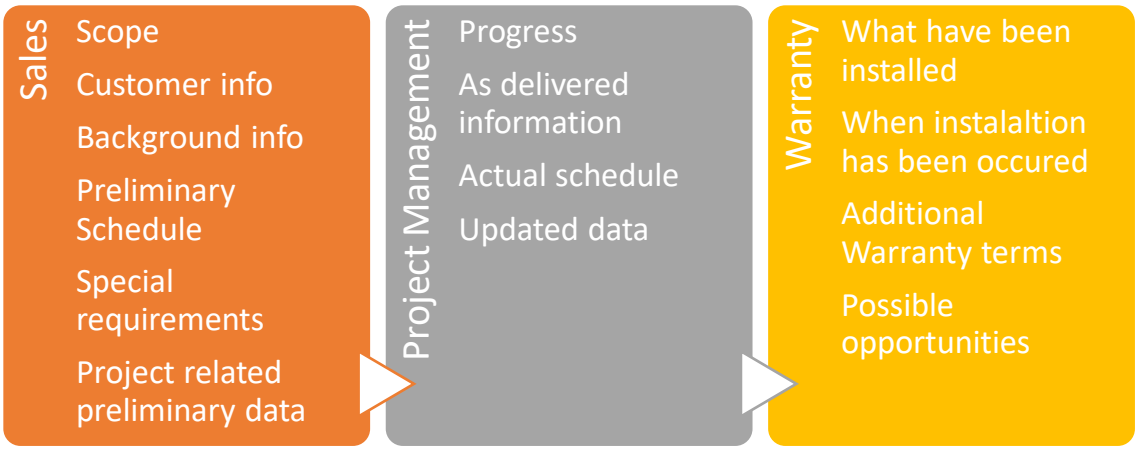

Figure 14. The flow of project related information and data

The final observation in the area of project management area is the internal organizational changes, which covers the structure of project management, business lines, areas of responsibility and company overall strategy. Nobody along the interviewees was not condemning the actual change and there would be no need for a change instead many respondents were criticizing the phase of changes. People are feeling that the company does not give enough time for the changes to get reasonable results out of it. Respondents were fearing that most results from changes will require time, and the first samples would not be always the correct one and if bigger decisions are based on these preliminary results, the direction of change can be wrong.

From development-related questions, interviewees considered the quality and development team as a useful and long-needed aspect within project management. The current team is the first of its kind which is a dedicated team within a project management organization that is only concentrating on the development of project management. Before development functions were located into higher levels in an organization and the results were not always so useful at the operative level. This aspect can be considered as one main benefit of the current quality and development team, it is close to the operative level, and can efficiently recognize and prioritize the areas where development is needed.

The main issue within the development was the speed of OE waves. This might be true, and further introduction about the fundamentals of OE waves could be shared, especially the sustainability phase which comes after the actual wave. Concentration to identifying the subjects and most importantly, the impact to operational level should be considered when categorizing development subjects into operational development and OE waves. The other issue was the transparency of end to end process, which means that what things are included in future development and what things are ongoing. One suggestion was to include short development topics into the global area meetings.

Figure 15. The structure of development types

The biggest challenge within the development is to ensure the overall picture of development and OE activities, even though many activities concerns processes and way of working adjustment, it is crucial to map the roadmap of development for the operative functions to ensure the proper alignment. As seen in figure 15, the development consists of multiple layers with different ways of doing the development. This can be confusing for people who are not familiar with different types of development and therefore the need for a complete roadmap is required. Now it seems that the target company is getting a higher function to monitor and align the internal development. Hopefully, this function

will also build an overall view about the ongoing development activities and can work as a link between OE and operational development.

The biggest challenges in development are the global aspect of the organization and also the fact that there are many other project management organizations also managing projects which do not have any organization linkage to the other project organizations. When people and organizations are scattered globally around the World, getting unified WoW, processes and development tools to everyone's needs is hard. The globalization brings many challenging attributes to the development which has to be taken account, even from even-handed treatment of people. Still, global organizations are a valuable aspect to the companies, where these organizations are generating great value and possibilities.

4.3.2 Analysis of Reporting requirements

reporting requests from customers are relatively similar and interviewees saw that one layout or template could satisfy most of the customers. The biggest difference was recognized between the required detail and the interval of reporting. Smaller customers were not so interested in the progress and were also keeping the overall communication as minimal as possible but in the case of bigger customers, the level on required information grew and the interval of reporting is higher.

The actual content of the required progress report would contain the main milestones of the project, where is shown the actual vs planned, open tasks, upcoming payments, input status from both parties, risk and deliveries. Some of these are already included in the standard template but most of them are missing. Another relevant notice was that the progress reporting based on the percentage does not tell anything to the customer, because the planned baseline is missing.

The first problem occurs in the level of reporting. The level of reporting is mainly linked to the size of the customer and the number of ongoing projects. Customers who have multiple projects ongoing in the barrel are expecting the portfolio view, where all projects with relevant information are presented. With the smaller customers, where might be only

one project, would like to see only lower-level information about the specific project. Therefore, the recommendation would be to build three information layers from picture 16, towards the customer; Product level for product-specific information, project level for project-specific and portfolio view to see the collection of to be delivered projects.

To tackle this issue, the preferred solution would be an interactive online report. Where all ongoing projects are displayed in the portfolio view and then the user could drill down to see more specific information about the project. This would then satisfy all customers with one solution. Still, the target company must be prepared to deliver the standard paper report for customers who might require it even though the online report would be available.

There are two ways to do this reporting, the first way would be a dedicated portal for customers, who could use specific link or credentials to access the information about customer dedicated projects. Currently, there is no such portal ready to use in this purpose, but some similar portal is existing inside the target company which would need additional enhancements and integration to be done before it could be used for progress reporting purposes as well.

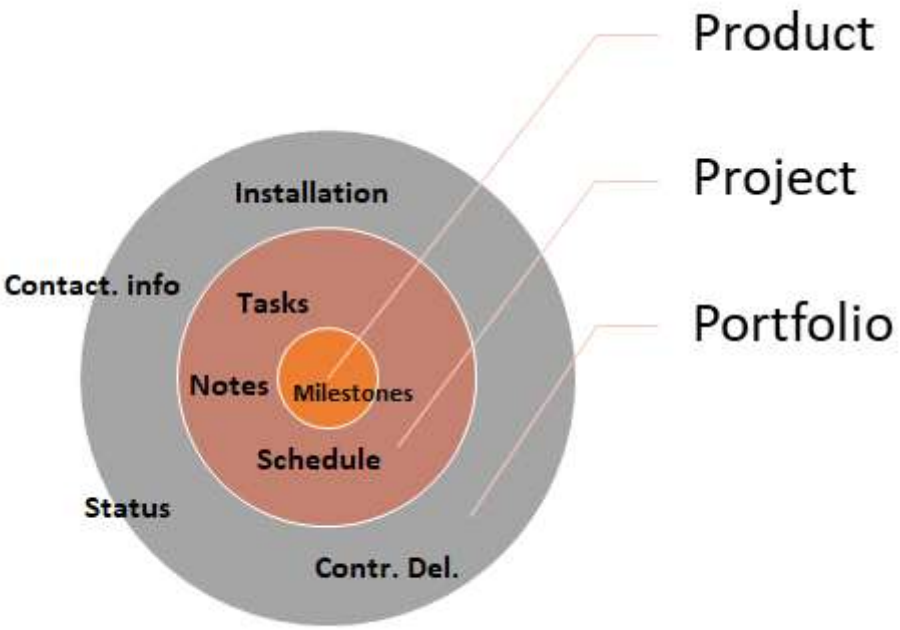

Figure 16. Information layers towards customer.

The second way is to build the power bi report, where a customer would be able to see relevant data. The benefits of power bi reports are mainly the easiness of doing reports as well as everything is already there. The target company has already needed the competence to create requested progress reporting reports. Nevertheless, the main disadvantages are the accessibility for customers. The main problems with power bi reports will be how to share those among the customer with and enough level of data protection? Currently, the sharing would be done only specific links where a customer could see only their projects. The access rights for reports are done through email, so all customer representatives' email addresses should be added to the access list and the list must be constantly maintained.

A further solution for reporting would be robots taking screenshots and sending them automatically by email to the customers. This would be the easiest way in the terms of credentials and license costs of different software but at the same time report would lose the interactivity what power bi is offering for the users.

The current proposal would be to create a sample report using the power bi with the pilot customer. After the report is commonly agreed to be satisfying, the research with other customers should be done that what further enhancements are required to report. When the template of the report is done, the delivery method must be decided. To support future development, one common tool towards customers must be determined, where all functionalities and customer linked things are stored. This will ease the confusion among the customer, when there is only one interface towards the customer, where all important information for the customer is stored.

5 SUMMARY AND CONCLUSION

5.1 Summary of Study

Project management is considered as a key element in the enterprises where delivery projects are the main business, there is a clear possibility that the true value and risk of project management is not recognized enough. Project management as a methodology is widely researched and it has been developed for decades. Therefore, an illusion that project management could not be developed or that it is enough to have a project manager to do their job can seriously reduce the potential value generated by project management.

When the crowing digitalization enables extensive globalization, project teams tend to grow global, where project team members are located all around the world. This creates a need for digital tools, for example, global ERP systems where the needs of project management and customer are considered. Project management is the brains of the project, where all the information about the project should end up automatically as human brains receive information from different senses. When the correct information is received, brains can act as it should be, ending up to the successful result.

For a global enterprise, area-based organizations are considered as beneficial in terms of customer satisfaction, cultural knowledge and team bonding. When certain persons are responsible for certain countries, should the support for project teams be accurate and specific. The disadvantage of the current setup was a lack of support from other functions. This means that there is the feeling that project management is feeding information for other functions without getting anything back. The deviation between WoW was recognized as an area organizational based problem where the integration of different teams and functions is missing.

The roles of project manager and engineer may deviate in small amounts. The main reason for this deviation is the structure and competence of the current project team. In terms of non-fixed project teams, this deviation is an understandable and positive thing and

indicates that project personnel can adjust their working when the environment around employees is changing. According to interviewees, there is an increasing need for much higher integration between departments in terms of WoW, tools and processes.

These three aspects are highly linked to integration management and according to the scientific literature, integration management is tightly linked into much better stakeholder requirement management, project performance and to project budget. Therefore, a higher level of integration must be made between project management departments, to achieve a common project management environment, where rules are acknowledged and project-related data is in the one, shared place.

The communication and data up-keeping were among several activities what interviewees were highlighted. When taken into account the global aspect of project teams, the importance of supportive tools and reports to highlight the date grows. The same data must be inputted several times in different places or even separate systems and there is no clear picture, is that data even used to anything. Many interviewees considered project management as a support function that is supposed to provide information to other functions within the organization. As a result of these findings, the target company should consider building internal systems and re-evaluate the position of project management. When talking about project deliveries, project management is the leading function, not a support function. The optimal state would be that project teams work is guided in the way that everything information which is needed internally in other organizations are inputted as project proceeds automatically with dedicated processes.

The case company has demand for a higher level of definitions for determining the scope, what is the product and what parts are belonging in it and which ones are not. This would need an authority to invite all internal stakeholders into the same table where higher-level agreement could be done. Another issue is how to sustain this further? Some interviewees were considering the PMO as a solution to the sustainability issue. With one common PMO, the project management methods, processes and WoW's could be monitored and guided if needed. The need for internal processes would decrease when the same rules apply in each project management team. When the framework of project management is

known within these teams, it will generate more flexibility among project management, where people can move within different kinds of projects easily when the foundation is already known.

Results from interviewees indicated the lack of a common tool for project management. It has been internally recognized and therefore target company is currently developing a project management tool, which will in future ensure the development of the project management into much more mature state where the project-related data is successfully utilized to make projects more sufficient and meeting the customer requirements within the time, scope and costs. To reduce the workload of project personnel, and at the same time increase, the efficiency of internal processes overall, the importance of covering all project management knowledge areas with this tool is important. When succeeding with these targets, The tool itself will increase the internal communication, flexibility of project teams, increased speed in decision making when data is available for everyone and the content of employees when they consider their work activities meaningful when transparency of data provided by them is ensured.

One of the missing key areas especially in these uncertain times is risk management. Currently, risk management was considered lacking almost completely and most of the decision authority of the project was top of a project manager. If the target company wants to increase its maturity within project management, risk management methods and tools should be included in the project delivery process and constantly monitored within the delivery process. The actual risk management needs also the framework and key principles. Commonly these are taken care of in PMO. If PMO is lacking, a project management organization must determine these things by itself. Project managers should only receive the framework of risk management, not to develop and use own methods and tools for project managing risks.

In the area of development, the project personnel are waiting for visible results, smarter ways to do their job, high transparency and future roadmap about development topics. There is room to improve in the areas of doing a more transparent plan about future topics. The speed of OE waves was considered sometimes too fast, so the possible re-evaluation

of OE topics can be considered to more efficiently recognize the right topics to be included in the OE pipeline. Even though OE is an excellent way to get things done in a limited time, all development-related topics are not suitable for the scope of OE and it will eventually reflect on the operative level. The development of project management, internal processes and tools were considered crucial. When results of development are clearly stated and the benefits are seen in daily work, it has a positive effect on working morale. For most people, it is important to be able to affect own work and therefore internal development is one way to support people to do the company even better.

In the reporting perspective, the case company has a lot of room to improve. The customer required data is partially missing from the database of the case company, quality of the data is not yet as the desired level and the more specific requirement specification from a customer must be made. The progress to solve these problems has already made, where a common project management tool is developed to ensure data availability and quality. The pilot customer has already chosen where the preliminary requirements will be gathered and the specifications for future report template will be made.

To achieve the needed level of data quality which could then displayed for a customer, a more user-friendly interface towards systems is needed. When an easy way for placing the required data is offered, it is likely to have increased data quality. The other thing is to ensure proper monitoring, where reports are playing a crucial role. At the moment the current ERP system does not provide sufficient user interface for project personnel and therefore the quality of data is bad. Therefore the-going development of a new project management tool is crucial and the backbone of future development of project management.

According to interviewees, there is a possibility to create one global project template to satisfy all customers. Later, possible AI solutions can be added to recognize the customer needs and modify the report for the desired form. It is always important to think, what information is relevant for end-users, especially in terms of schedule, where current versus planned overview should be clearly stated. Currently, the standard reporting template

displays only progress with percentage, which does not contain any valuable information for a customer.

Things that must be considered are data protection, where the case company must ensure that only needed data is available for each customer and the way of distributing the reports towards customers. The actual developing process must be concentrating highly into the pilot phase, and the ned results must follow closely the first-time right-thinking where the customer point of view is strongly kept in mind. With online reporting towards the customer, more efficient and time-consuming communication can be made. Reacting for changes can be done with mutual agreement much faster when both parties have the same data available. Naturally, increased transparency and efficiency in stakeholder communication tend to lead to higher customer satisfaction.

5.2 Conclusion and future study

The challenges of globalization within the case company's project management are important to acknowledge. Biggest challenges are related to communication, a common way of working, lack of authority to oversee the common alignment within case company and lack of clear guidance about the data upkeep, what and how the data should be inputted and upkeep. When we study the maturity of current project management, we can see a lot of improvement topics within project management knowledge areas but as results from interviews, the most critical development actions should be taken around cost, scope, risk and stakeholder management topics.

This thesis will highlight the areas where project management personnel is currently struggling and highlighting general areas for future development. It is important to remember when the size of a global company is enough big, internal activities tend to be slower and therefore effective development strategy for the development of project management is also needed to take maximal benefit from invested money and time. Even though the current development activities were considered useful, people would like to see more concrete results from development. This might be only because of the lack of

correct communication, but it is obvious that the benefits of the development of project management in target company were seen as a crucial function to ensure the customer and employee satisfaction, better internal process quality and diverting effective work hours from no value-generating activities to actions generating actual value.

There are plenty of further possible research topics, where researches biggest questions are concerning, how to collect all relevant feedback and ideas related to development topics from a global organization? The second possible research topic would be to study the way of efficient communication within the global organization and how to conduct it? These topics are heavily contributing to the development where an organization is steering with feedback and ideas the development stream into the correct way.

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APPENDICES

APPENDIX 1. Report draft from portfolio view

Appendix 2. Questions for interview

1. Background
   a. What is you position in the company?
   b. How many years of experience you have from project management?
   c. How you consider the structure of project management department in your organization?
   d. Do you have studies in the field of project management?

2. Project management
   a. How you can define your role/mission within project management?
   b. Referring to the 10 PMI knowledge areas of project management, what are the 3 most important areas in your opinion?
   c. How do *you* see, are there currently enough tools and processes to support you in these areas?
   d. What would be the most important areas where tools or processes could be enhaced of develop? Name three.
   e. How project management department has been changed during your carrieer in project management organization?

3. Development function in project management
   a. How you consider the development team's guidance and support regarding your daily work?
   b. How you consider the transparency of development initiatives?
   c. Would you want to be more involved to the development activities?
   d. What expectations you have from development team?

4. Reporting
   a. Taken account your experience with customer, what are the most recent customer requirements when talking about project progress reporting?
   b. What information you are already reporting as standard for customer?
   c. According to your experience, is there big differences between customers reporting requirements?
   d. List the things what should at least be included to **common project progress report template** which can be sent to customer.